WISCONSIN

Air Cooled

HEAVY DUTY ENGINES

INSTRUCTION BOOK AND PARTS LIST

MODEL VP4D

ISSUE MM-233-B

WORLD'S LARGEST BUILDERS OF HEAVY DUTY AIR COOLED ENGINES

IMPORTANT

Since there is a right way, and many wrong ways to operate an engine, it is important that this manual be read carefully before you start your engine. This will avoid unnecessary delays and expense which might be caused by improper operation.

The various bearing surfaces in a new engine have not been glazed, as they will be with continued operation, and it is in this period of "running in", that special care must be exercised, otherwise the highly desired glaze will never be obtained. A new bearing surface that has once been damaged by carelessness will be ruined forever.

THEREFORE READ INSTRUCTIONS CAREFULLY

A copy of this manual is sent out with each engine. All points of operation and maintenance have been covered as carefully as possible but if further information is required, inquiries sent to the factory will receive prompt attention.

When writing the factory ALWAYS GIVE THE MODEL AND SERIAL NUMBER of engine referred to.

Extra copies of this manual are $1.00 each.

WISCONSIN MOTOR CORPORATION
MILWAUKEE 46. WISCONSIN

BOOK OF INSTRUCTIONS

WISCONSIN
FOUR CYLINDER ENGINES

☆

MODEL VM4

3¼" Bore
4" Stroke
132.7 cu. in. Disp.

MODEL VP4

3½" Bore
4" Stroke
154 cu. in Disp.

☆

NOTE: The letter "D" suffixed to the engine model, designates that the engine has Stellite exhaust valves and inserts

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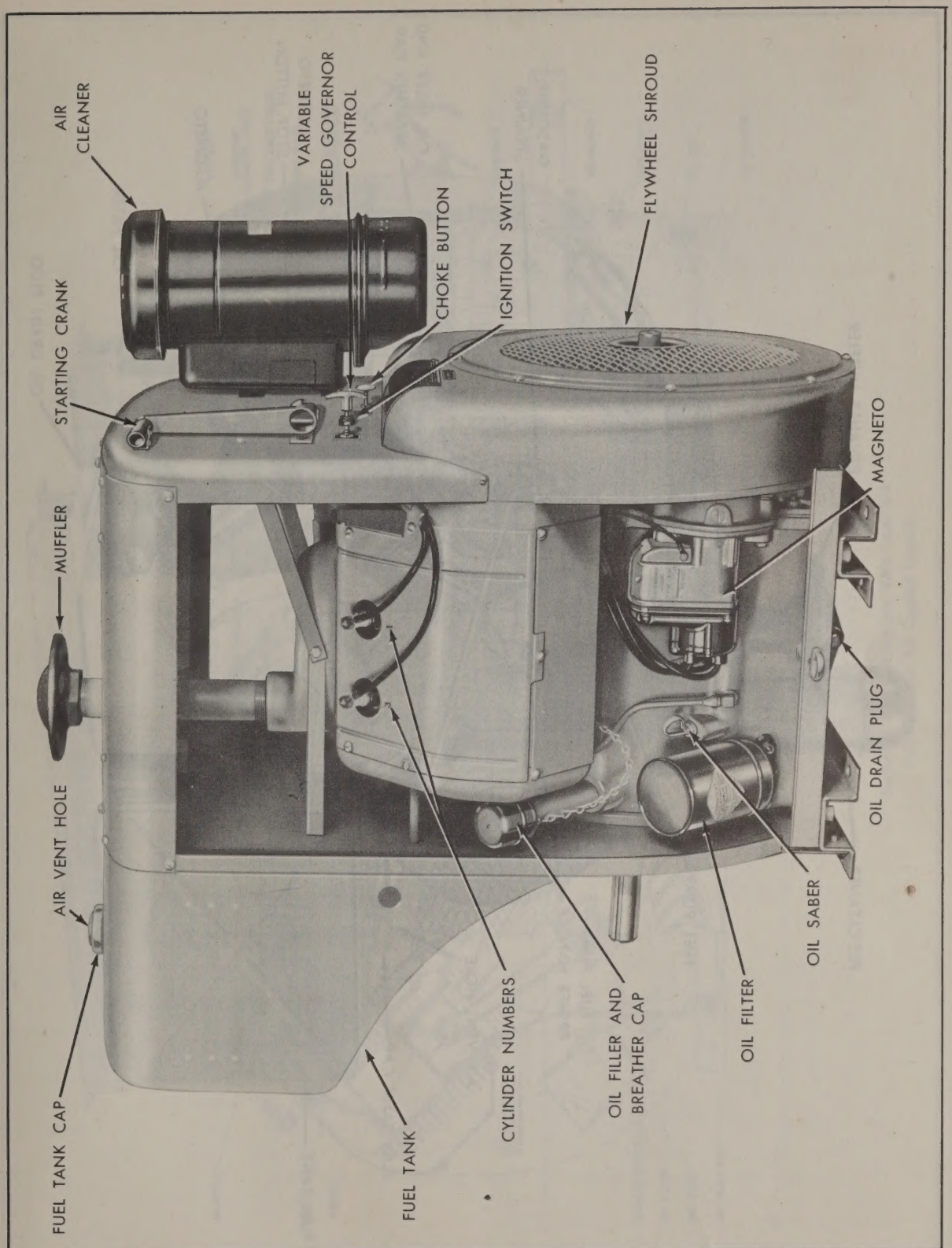

Fig. 1

POWER UNIT FAN END VIEW OF ENGINE

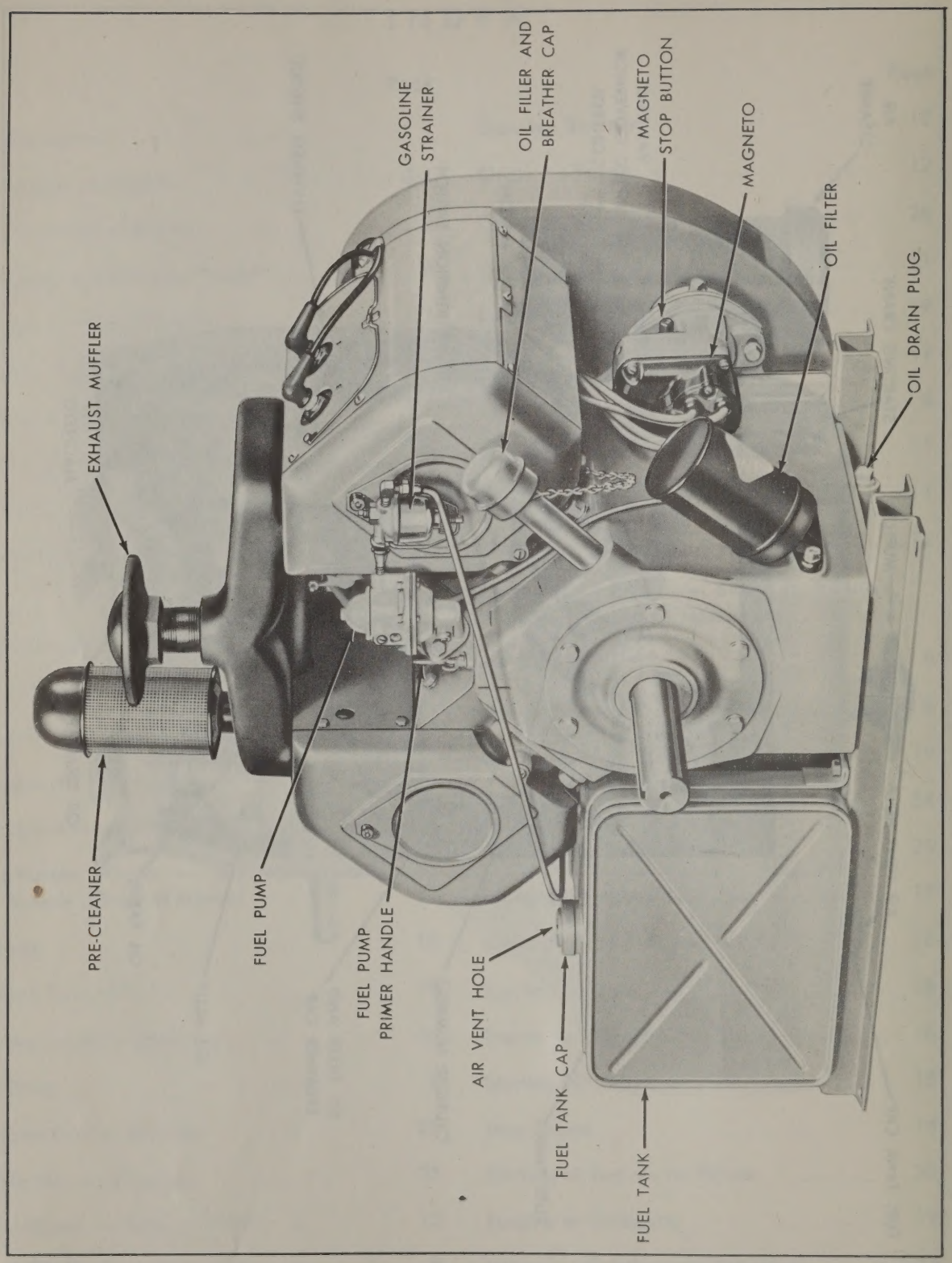

Fig. 2

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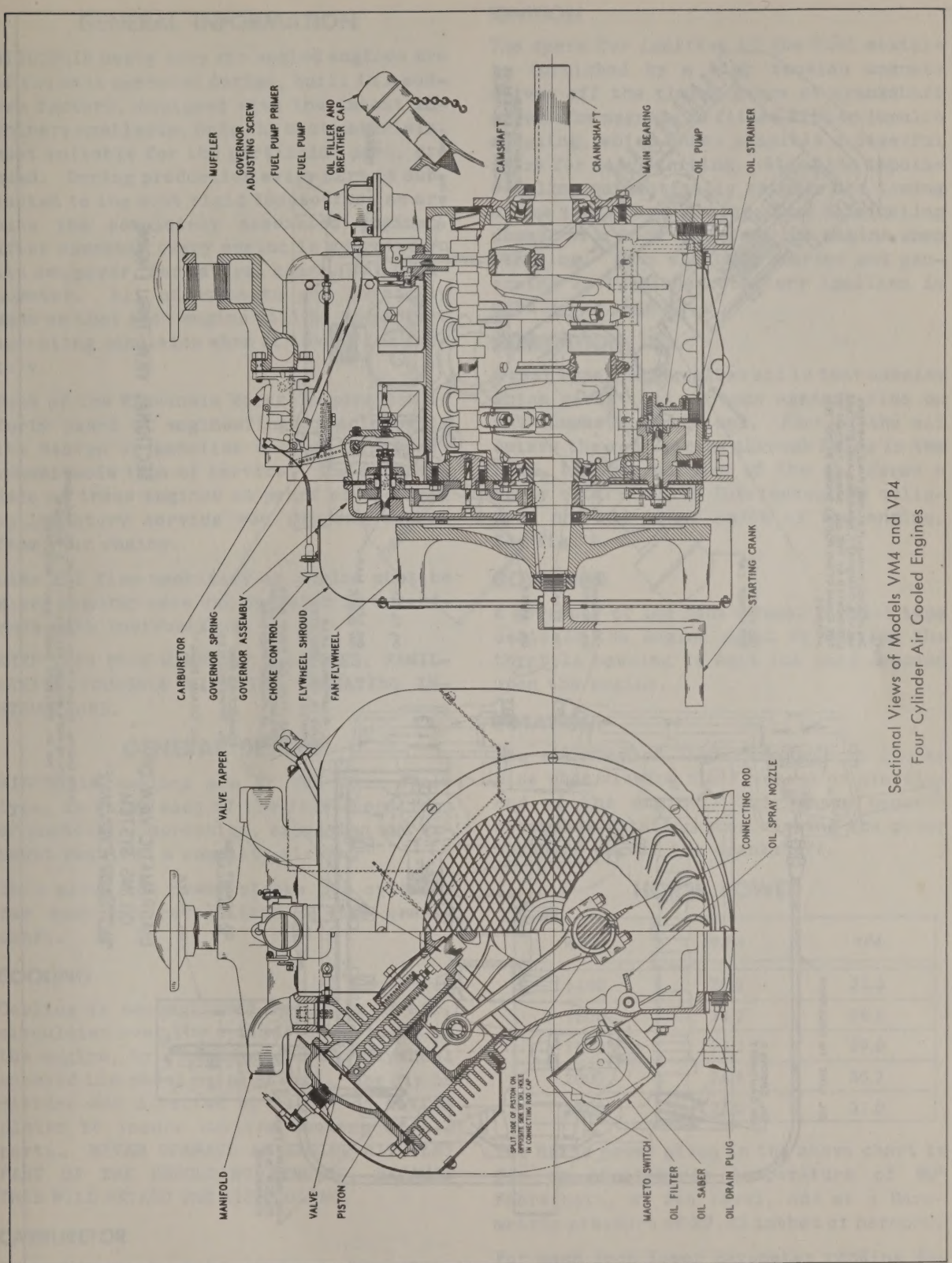
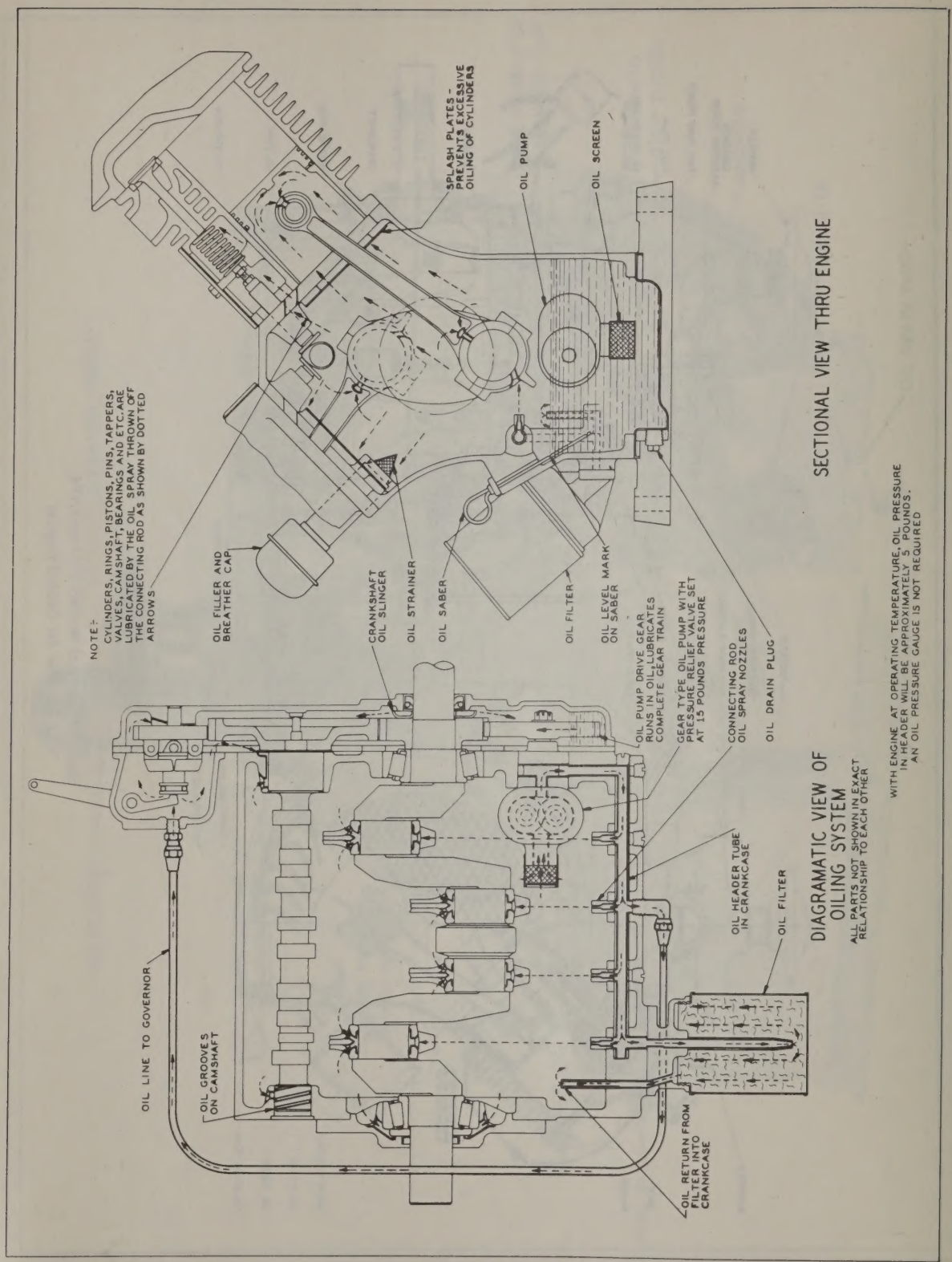
TAKE-OFF (Side Mount Tank) VIEW OF ENGINE



Sectional Views of Models VM4 and VP4
Four Cylinder Air Cooled Engines

Fig. 3

CROSS SECTION OF ENGINE


SECTIONAL VIEW THRU ENGINE
DIAGRAMATIC VIEW OF OILING SYSTEM
ALL PARTS NOT SHOWN IN EXACT RELATIONSHIP TO EACH OTHER
WITH ENGINE AT OPERATING TEMPERATURE, OIL PRESSURE IN HEADER WILL BE APPROXIMATELY 5 POUNDS. AN OIL PRESSURE GAUGE IS NOT REQUIRED
NOTE:- CYLINDERS, RINGS, PISTONS, PINS, TAPPERS, VALVES, CAMSHAFT, BEARINGS AND ETC. ARE LUBRICATED BY THE OIL SPRAY THROWN OFF THE CONNECTING ROD AS SHOWN BY DOTTED ARROWS
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OIL SCREEN
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OIL LEVEL MARK ON SABER
OIL PUMP DRIVE GEAR RUNS IN OIL, LUBRICATES COMPLETE GEAR TRAIN
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CONNECTING ROD OIL SPRAY NOZZLES
OIL DRAIN PLUG
OIL HEADER TUBE IN CRANKCASE
OIL FILTER
OIL LINE TO GOVERNOR
OIL GROOVES ON CAMSHAFT
OIL RETURN FROM FILTER INTO CRANKCASE

Fig. 4

OILING SYSTEM — LUBRICATION CHART

GENERAL INFORMATION

WISCONSIN heavy duty air cooled engines are of the most approved design, built in a modern factory, equipped with the latest machinery available. Only the best materials, most suitable for the particular part, are used. During production every part is subjected to the most rigid inspection, as are also the completely assembled engines. After assembly every engine is operated on its own power, for several hours, on a dynamometer. All adjustments are carefully made so that each engine will be in perfect operating condition when it leaves the factory.

Back of the Wisconsin Motor Corporation is forty years of engineering experience in the design of gasoline engines for every conceivable type of service. The performance of these engines is proof of the long satisfactory service you too can expect from your engine.

Like all fine machinery an engine must be given regular care and operated in accordance with instructions.

KEEP THIS BOOK HANDY AT ALL TIMES, FAMILIARIZE YOURSELF WITH THE OPERATING INSTRUCTIONS.

GENERAL DESIGN

WISCONSIN engines are of the four cycle type, in which each of the four operations of suction, compression, expansion and exhaust requires a complete stroke.

This gives one power stroke per cylinder for each two revolutions of the crankshaft.

COOLING

Cooling is accomplished by a flow of air, circulated over the cylinders and heads of the engine, by a combination fan-flywheel encased in a sheet metal shroud. The air is divided and directed by ducts and baffle plates to insure uniform cooling of all parts. NEVER OPERATE AN ENGINE WITH ANY PART OF THE SHROUDING REMOVED, BECAUSE THIS WILL RETARD THE AIR COOLING.

CARBURETOR

The proper combustible mixture of gasoline and air is furnished by a balanced carburetor, giving correct fuel to air ratios for all speeds and loads.

IGNITION

The spark for ignition of the fuel mixture is furnished by a high tension magneto driven off the timing gears at crankshaft speed. The magneto is fitted with an impulse coupling, which makes possible a powerful spark for easy starting. Also, the impulse coupling automatically retards the timing of the spark for starting, thus eliminating danger of a kick back from the engine when starting. When electric starter and generator is furnished, battery ignition is used. See page 12.

LUBRICATION

A gear type pump supplies oil to four nozzles which direct oil streams against fins on the connecting rod caps. Part of the oil enters the rod bearing through holes in the rods, and the balance of the oil forms a spray or mist which lubricates the cylinders and all other parts of the engine. See Fig. 4.

GOVERNOR

A governor of the centrifugal flyball type controls the engine speed by varying the throttle opening to suit the load imposed upon the engine.

ROTATION

The rotation of the crankshaft is clockwise when viewing the flywheel or starting end of the engine. This gives counter clockwise rotation when viewing the power take off end of the crankshaft.

HORSE POWER

R.P.M.	VM4	VP4
1400	20.2	23.5
1600	23.2	26.8
1800	25.2	29.0
2000	26.5	30.2
2200	27.0	31.0

The horse power given in the above chart is for an atmospheric temperature of 60° Fahrenheit, at sea level, and at a Barometric pressure of 29.92 inches of mercury.

For each inch lower Barometer reading deduct 3½% from above horsepower.

For each 10° higher temperature there will be a reduction in horsepower of 1%.

For each 1000 ft. altitude above sea level there will be a reduction in horsepower of 3%.

The friction in new engines cannot be reduced to the ultimate minimum during the regular block test, but the engines are guaranteed to develop at least 85 per cent of maximum power when shipped from the factory. The power will increase, as friction is reduced, during a few days of operation.

INSTRUCTIONS FOR STARTING AND OPERATING

Some of these engines are furnished with a house, as shown in Fig. 2, while others are furnished without a house, as shown in Fig. 1.

ON ENGINES WITH A HOUSE THE SIDE DOORS SHOULD ALWAYS BE REMOVED WHEN OPERATING. This is to give better circulation of air for cooling the engine.

LUBRICATION

Before starting the engine, fill the oil base with good gasoline engine oil. Fill through the breather pipe UP TO "FULL" LINE ON OIL GAUGE SABRE, see Fig. 4. On most of these engines the sabre is on the magneto side, except when some accessories interfere then it is located on the opposite side.

Too much emphasis cannot be given to the matter of oil selection. High grade oil of the body suited to the requirements of your engine is the most important single item in the economical operation of the unit, yet it is the cheapest item of operating cost. Select your oil solely on quality and suitability — never on price — for no one thing is so sure to bring about unsatisfactory performance and unnecessary expense as incorrect lubrication.

High-grade, highly refined oils corresponding in body to the S.A.E. (Society of Automotive Engineers) Viscosity Numbers listed in the following chart will prove economical and assure long engine life.

IMPORTANT: S.A.E. Viscosity Numbers classify oils in terms of body only, without consideration of quality or character, therefore we list certain grades of MOBILOIL as typical examples of lubricants possessing the qualities we believe desirable in oils for WISCONSIN engines. We plainly state that these grades of MOBILOILS are listed because of their recognized quality and world-wide distribution. THERE ARE OTHER HIGH QUALITY OILS ON THE MARKET THAT ARE EQUALLY SATISFACTORY FOR WISCONSIN ENGINES.

GRADE OF OIL

Season or Temperature	Grade of Oil	Example
Spring, Summer or Autumn +120°F. to +40°F.	SAE 30	Mobiloil "A"
Winter +40°F. to +5°F.	SAE 20	Mobiloil "Arctic"
Winter +5°F to -20°F	SAE 10W	Mobiloil "Arctic Special"
Crankcase Capacity		5 Qts.

Follow summer recommendations in winter if engine is housed in warm building.

CHECK OIL LEVEL EVERY 8 HOURS OF OPERATION.

THE OLD OIL SHOULD BE DRAINED AND FRESH OIL ADDED AFTER EVERY 50 HOURS OF OPERATION.

To drain oil remove drain plug. See Fig. 4. Oil should be drained while engine is hot, as it will then flow more freely.

At engine operating temperature the oil pressure will be about 4 to 5 pounds per square inch. Due to this low pressure system an oil pressure gauge is not required. When the engine is cold the pressure will be higher and a relief valve is fitted to the oil pump so that under these conditions the maximum pressure will be limited to 15 pounds.

OIL FILTER

A by-pass type oil filter is furnished on these engines, see Fig. 4, except in a few cases where the use of other accessories prevents the fitting of the oil filter. The oil filtering element should be replaced after every 300 hours of operation. See Fig. 5.

AIR CLEANER

The air cleaner is an essential accessory, filtering the air entering the carburetor, and thereby prolonging the life of the engine.

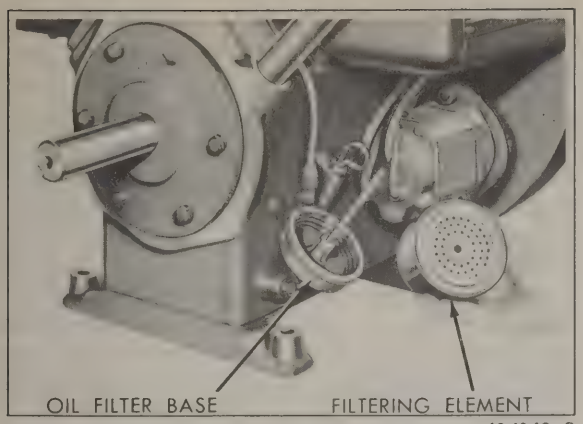

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Fig. 5

Remove the bowl from the air cleaner. See Fig. 6 and Fig. 7. Fill bowl to oil level line with the same grade of oil as used in the crankcase. Detailed instructions are printed on the Air Cleaner.

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Fig. 6

The air cleaners must be serviced frequently, depending on the dust conditions where the engines are operated. When the oil in the bowl becomes dirty it should be removed and replaced with new oil. This servicing will vary from a few days of operation in comparatively clean conditions to twice a day in dusty conditions.

OPERATING THE ENGINE UNDER DUSTY CONDITIONS WITHOUT OIL IN THE AIR CLEANER OR WITH DIRTY OIL, MAY WEAR OUT CYLINDERS, PISTONS, RINGS AND BEARINGS IN A FEW DAYS TIME, AND RESULT IN COSTLY REPAIRS.

When a collector type precleaner is used on top of air cleaner the glass jar should be emptied of accumulated dirt frequently as it collects, depending on dust conditions. See Fig. 7. DO NOT USE OIL OR WATER IN GLASS PRECLEANER JAR. THIS SHOULD BE KEPT DRY.

Daily attention to the air cleaner is one of the most important considerations in prolonging engine life.

Fig. 7

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FUEL

These engines are furnished either with gravity feed tanks mounted above the level of the carburetor, or with side mount tanks or tanks mounted below the engine. In the latter two cases, fuel pumps are furnished on the engines, to pump the fuel up to the carburetor.

The fuel tank should be filled with a good quality of gasoline free from dirt and water. Some of the poorer grades of gasoline contain gum which will deposit on valve stems, piston rings, and in various small passages in the carburetor and thus cause

serious trouble in operating, and in fact might prevent the engine from operating at all.

WE RECOMMEND USING GASOLINE WITH AN OCTANE RATING OF 70 to 75.

Fuel with a lower octane rating will cause detonation, and if operation is continued under this condition severe damage will result to the engine. The cylinders and pistons will be scored, head gaskets blown out, bearings will be damaged, etc.

Be sure to open the gasoline shut off valve below the fuel tank when gravity feed tanks are used. Also be sure air vent hole in fuel tank cap is open, otherwise gas cannot flow to carburetor.

GASOLINE STRAINER

The gasoline strainer on the bottom of the fuel tank is very necessary to prevent sediment, dirt and water from entering the carburetor and causing trouble or even complete stoppage of the engine. This strainer has a glass bowl and should be inspected frequently, and cleaned if dirt or water is present. To remove bowl, first shut off fuel valve, then loosen the knurled nut below bowl and swing the wire bail to one side. After cleaning bowl and screen, replace the parts, being sure the gasket is in good condition; otherwise use a new gasket. See Fig. 8.

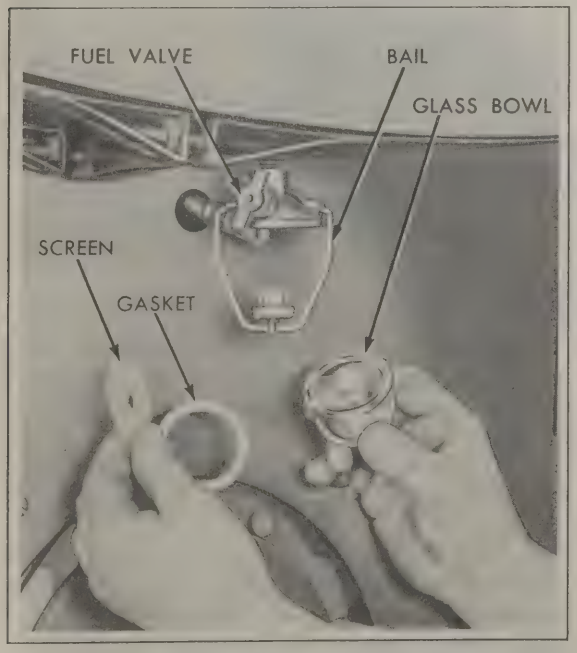

Fig. 8 71051C

FUEL PUMP

On engines equipped with fuel pumps, when starting the first time, or when engines have been out of operation for a while, the hand primer lever on the fuel pump should be used before attempting to start, so that fuel may be pumped into the dry carburetor, otherwise starting would be very difficult. When priming by hand lever, a distinct resistance of the fuel pump diaphragm should be felt. If this is not the case the engine should be turned over a revolution so that the fuel pump cam will be rotated from its upper position which would prevent hand priming. This hand lever should be given about 20 to 30 strokes, depending on how much fuel, if any, there is in the carburetor float chamber. See Fig. 9. When the carburetor is full the hand primer lever will move more easily.

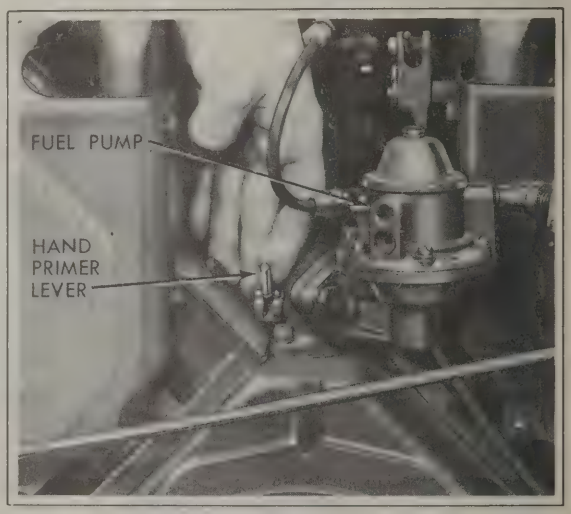

Fig. 9 83622C

CHOKE

Before starting a cold engine close the choke on the carburetor by pulling out the choke button at the flywheel end of the engine. See Fig. 2. When the engine is started the choke should be opened gradually as the engine warms up. More choking is necessary when starting in cold weather than in warm. If the engine is warm, very little choking is necessary. The operator will soon gain experience in how much choking is necessary. The choke button should always be pushed in after the engine is warmed up.

The choke is closed when button is pulled out, and open when button is pushed in.

CARBURETOR

The main metering jet in the carburetor is of the fixed type, that is, it requires no adjustment. The idle needle should be adjusted for best low speed operation, while carburetor throttle is closed by hand. For illustrations and more information see Carburetor Manufacturer's Instruction Bulletin in back of this book.

IGNITION SWITCH

Magneto ignition is standard on these engines with a push button type switch on the side of the magneto which is always in the "on" or running position, except when depressed for stopping the engine. See Fig. 1.

On engines with a house, the ignition switch is on the outside of the house at the flywheel end. See Fig. 2. To run engine with magneto ignition, this switch is pushed in; with battery ignition, it is pulled out.

MAGNETO

Magnetos are properly adjusted before leaving factory. The breaker points on the Fairbanks Morse Magneto should be .012" and on the Wico Magneto .015" at full separation. If the spark becomes weak after continued operation it may be necessary to readjust these points. To do this first remove the end cover on the magneto. See Fig. 10 which shows the end cover of the Fairbanks Morse Magneto removed. The crankshaft should then be rotated with the starting crank, (this also rotates the Magneto), until the breaker points are wide open. The opening or gap should then be measured with a feeler gauge and if necessary reset as shown in Fig. 10. To readjust points first loosen the lock-screw on the

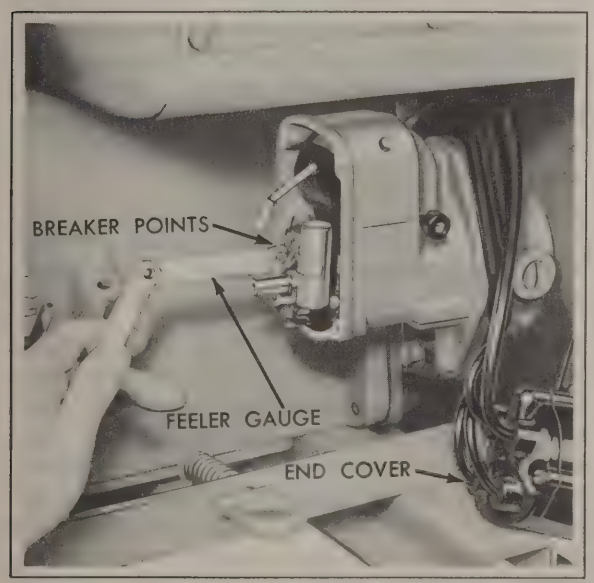

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Fig. 10

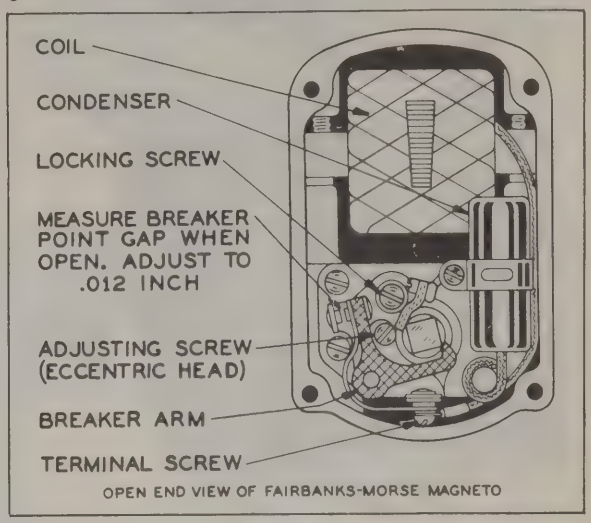


Fig. 11

breaker point plate, then turn eccentric adjusting screw right or left until proper gap is attained, then be sure to retighten lock-screw. All of these parts are shown in Fig. 11. After tightening lock-screw, recheck breaker point gap, to make sure it has not changed. If it is found that the breaker points have become rough, they should be smoothed with a breaker point file before the above adjustments are made. Then replace magneto end cover carefully so that it will seal properly. Do not force cover screws too tightly otherwise cover may crack. For further information see Fairbanks Morse or Wico Magneto Maintenance Manual in back of this book.

MAGNETO IGNITION SPARK

If difficulty is experienced in starting the engine or if engine misses firing, the strength of the ignition spark may be tested by removing the ignition cable from the spark plug and holding the terminal ⅛ inch away from the cylinder head shroud, as shown in Fig. 12. Turn the engine over slowly by the starting crank as shown.

When the impulse coupling on the magneto snaps there should be a good spark at the ignition cable terminal. If there is a weak spark, or none at all, first check breaker point opening as mentioned in preceding paragraph under "Magneto". If this does

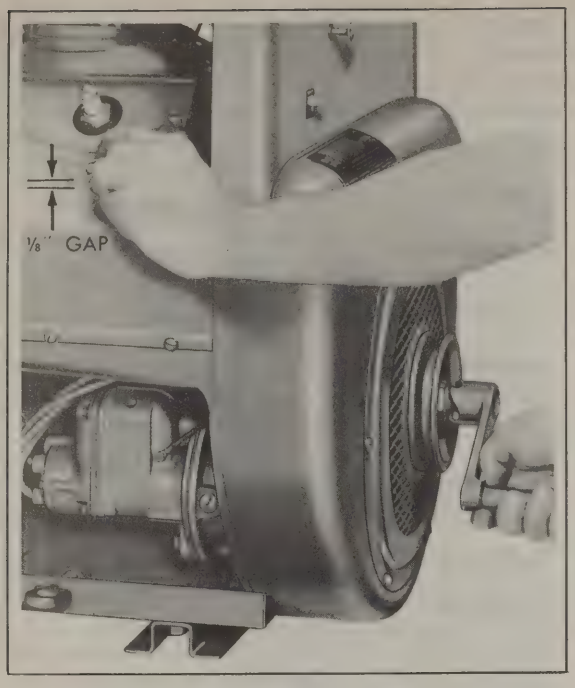


Fig. 12

not remedy the trouble, it may be necessary to install a new condenser. See Magneto Manufacturer's Maintenance Manual in back of this book.

MAGNETO TIMING

The magneto is properly timed at the factory, but if for any reason it is necessary to retime the magneto, the following instructions will be helpful.

First remove the screen over the flywheel air intake opening by taking out the eight screws holding the screen in place. This will expose the timing marks on flywheel shroud for timing magneto. See Timing Diagram, Fig. 13.

Next remove the spark plug from No. 1 cylinder. Then turn engine over slowly with the starting crank until the compression in this cylinder blows the air out of the spark plug hole.

The flywheel is marked with the letters DC near one of the air circulating vanes. This vane is further identified by a mark cast on the end. See Diagram, Fig. 13. When the air blows out of the No. 1 spark plug hole, continue turning the starting crank until the edge of the marked vane on flywheel is in line with the mark on shroud as shown on Timing Diagram. Then leave flywheel in this position. (At this point No. 1 and No. 4 cranks are vertical. The keyway at take-off end of crankshaft is also on top.)

The magneto should then be fitted to the engine so that the marked tooth on the magneto gear is visible through the opening in timing gear housing as shown on Timing Diagram, Fig. 13. The distributor cap on the magneto is numbered from 1 to 4. The leads from the magneto should be connected to spark plug of like numbers.

When magneto is properly timed the impulse coupling will snap when keyway in crankshaft is in line with cylinders. This can be checked by turning crankshaft over slowly by hand. This check can only be made on installations where keyway is not covered by other parts of equipment.

The proper spark advance is 25°.

The magneto rotates at crank shaft speed in clockwise direction when viewing driving gear end of magneto.

BATTERY IGNITION DISTRIBUTOR

When these engines are furnished with electric starters and generators, battery ignition is used, instead of magneto ignition. The ignition timer and distributor are mounted on the end of the generator.

The distributor rotates at engine speed in counterclockwise direction when viewed from above.

The proper spark advance for normal speeds is 25° the same as for magneto ignition. The distributor has an automatic advance of 15° so that at very low speeds, (below 500 R.P.M.) there would be an ignition advance of 10° before top dead center position of the piston.

The distributor is of course properly timed at the factory, but the following instructions are given as a help in retiming if this becomes necessary for any reason.

First remove the screen over the flywheel air intake opening by taking out the eight screws holding the screen in place. This will expose the timing marks on the flywheel shroud, also the vane on flywheel, marked by an "X" and the letters D.C. See Fig. 14. Then remove the spark plug from No. 1 cylinder and turn engine over slowly, by the starting crank until the compression blows the air out of the spark plug hole.

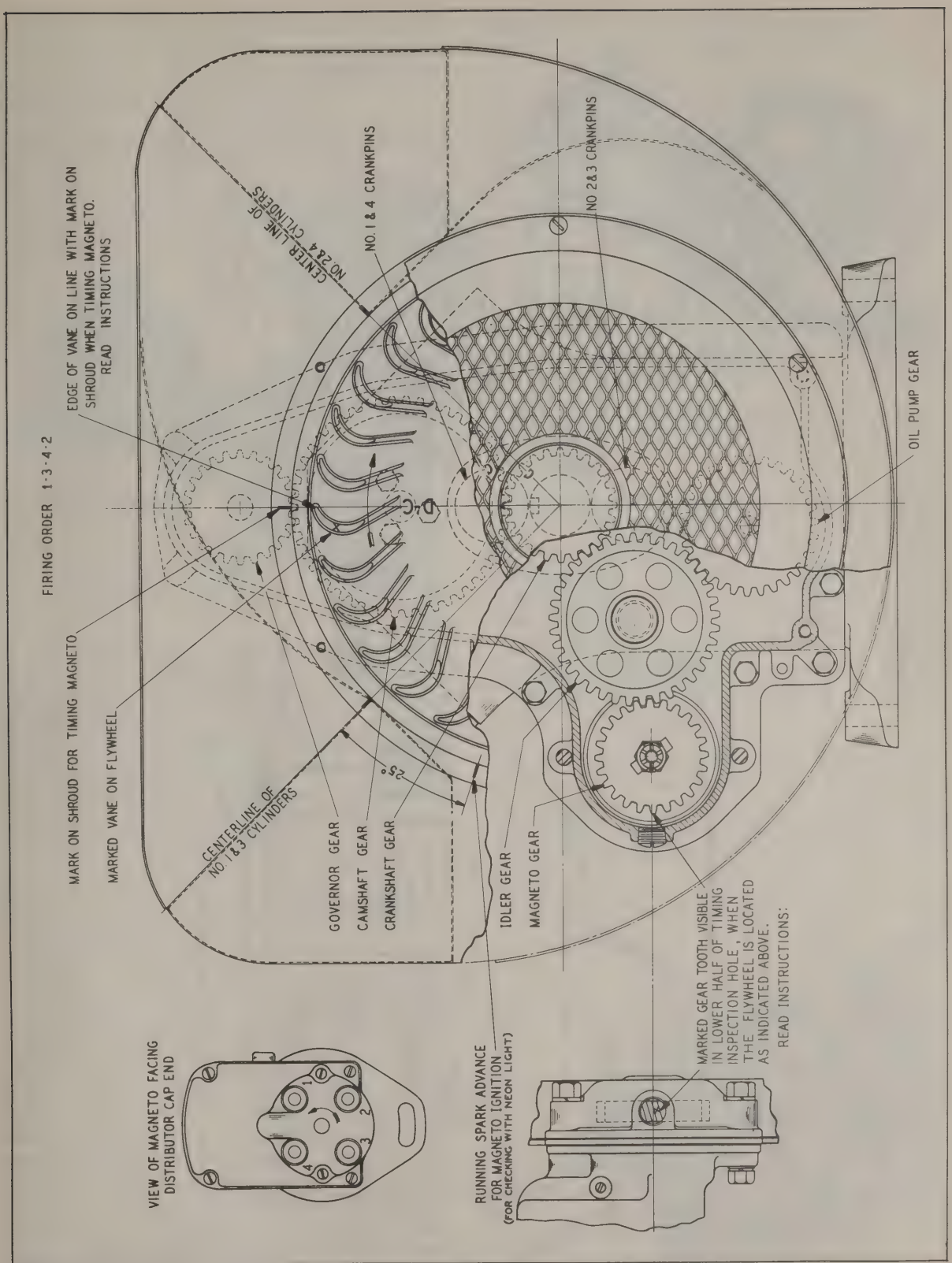

FIRING ORDER 1-3-4-2
EDGE OF VANE ON LINE WITH MARK ON SHROUD WHEN TIMING MAGNETO. READ INSTRUCTIONS
MARK ON SHROUD FOR TIMING MAGNETO
MARKED VANE ON FLYWHEEL
CENTERLINE OF NO 1 & 3 CYLINDERS
CENTER LINE OF NO 2 & 4 CYLINDERS
NO. 1 & 4 CRANKPINS
NO 2 & 3 CRANKPINS
OIL PUMP GEAR
25°
GOVERNOR GEAR
CAMSHAFT GEAR
CRANKSHAFT GEAR
IDLER GEAR
MAGNETO GEAR
VIEW OF MAGNETO FACING DISTRIBUTOR CAP END
RUNNING SPARK ADVANCE FOR MAGNETO IGNITION (FOR CHECKING WITH NEON LIGHT)
MARKED GEAR TOOTH VISIBLE IN LOWER HALF OF TIMING INSPECTION HOLE, WHEN THE FLYWHEEL IS LOCATED AS INDICATED ABOVE. READ INSTRUCTIONS:

Fig. 13

MAGNETO TIMING DIAGRAM

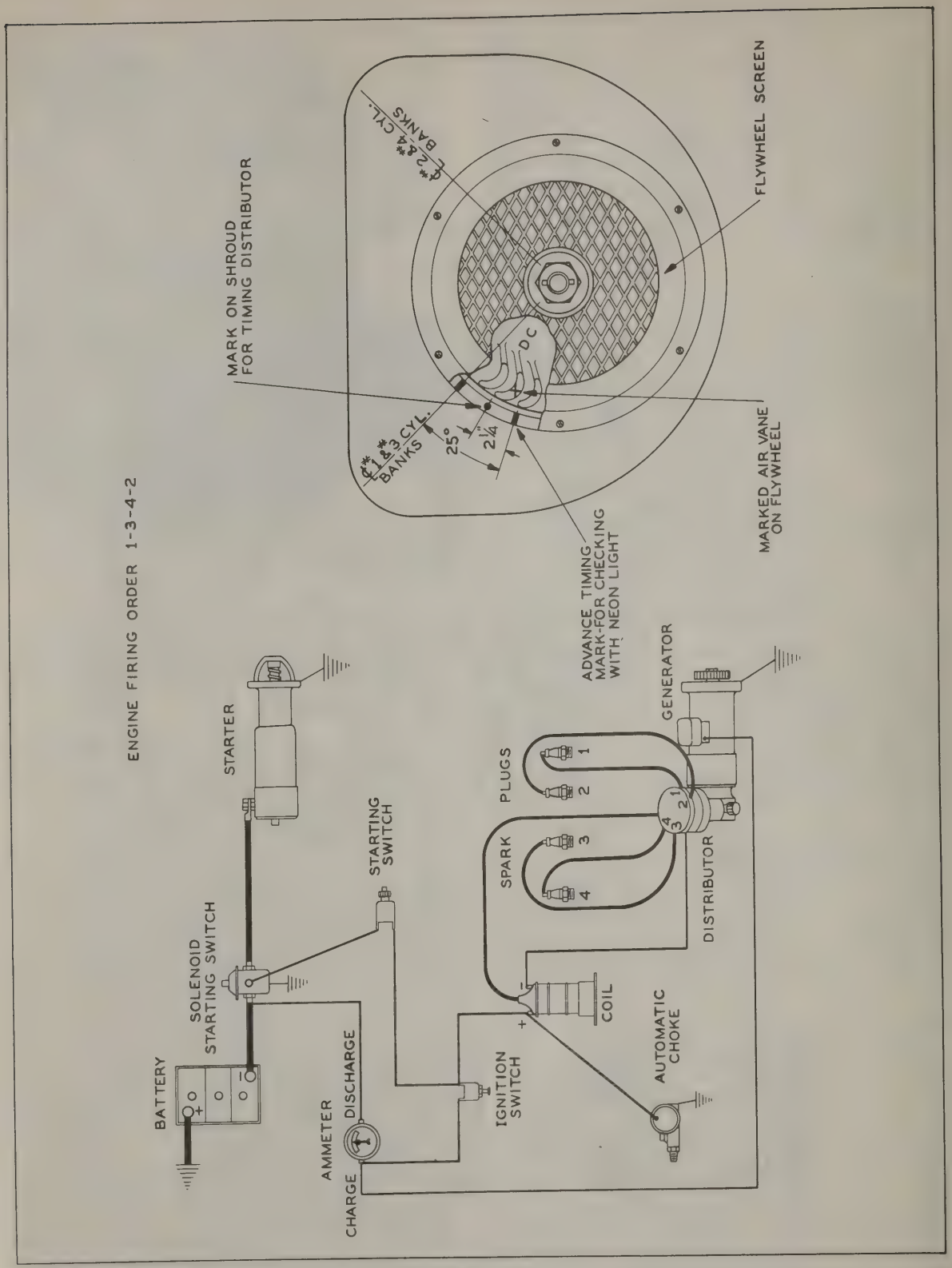


Fig. 14

BATTERY IGNITION — WIRING AND TIMING DIAGRAM

Continue turning starting crank until the leading edge of the marked vane on flywheel is in line with the center punch mark on the flywheel shroud. See Fig. 14.

Remove upper half of distributor body by disengaging snap springs.

The distributor rotor should then line up with center of the notches in the distributor housing. See Fig. 15.

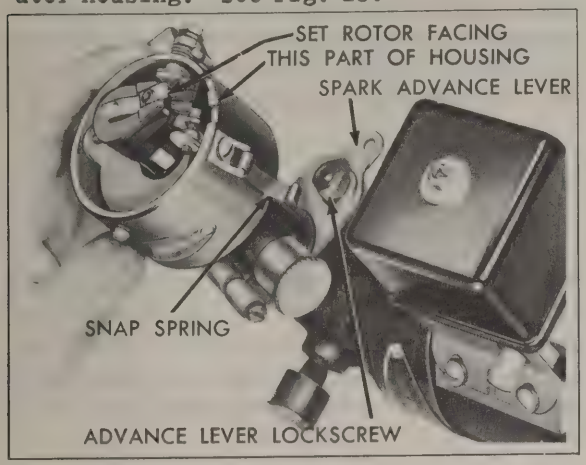


Fig. 15 77930C

If the rotor is not in this position withdraw entire distributor from the generator, and re-engage the gears at the bottom of distributor in a new position so rotor will be located properly. The spark advance lever should now be locked firmly in position by the advance lever lockscrew. See Fig. 15, as a manual spark advance is not used with these engines.

With the distributor clamp screw loose, see Fig. 16, first turn the distributor body slightly in a counter clockwise direction until the breaker points are firmly closed. Then turn the distributor body in a clockwise direction until the breaker points are just beginning to open. At this point a slight resistance can be felt as the breaker point cam strikes the breaker point arm. The distributor clamp screw should then be tightened, so the distributor will be held firmly in this position. The maximum breaker point should be .018 to .022 inches. This opening should be checked before the distributor body is set, otherwise any adjustment made to the breaker point opening will change the ignition advance adjustment. If care is exercised in the above operations the spark timing should be accurate enough for satisfactory operation.

Fig. 16 77931C

If it is desired to recheck the ignition timing with a neon lamp, this may be done as follows:-

Connect the neon lamp in series with the No. 1 spark plug ignition cable. Chalk the end of the marked vane on the flywheel, using white chalk. Then with the engine operating at normal speed, allow the flash from the neon lamp to illuminate the whitened vane. At the time of the flash, the leading edge of the vane should line up with the "running spark advance mark" on the flywheel housing. See Fig. 14.

The four ignition cables from the distributor should be connected to the same number spark plug as the number on the distributor. See Fig. 17. The center cable from the distributor is connected to the ignition coil.

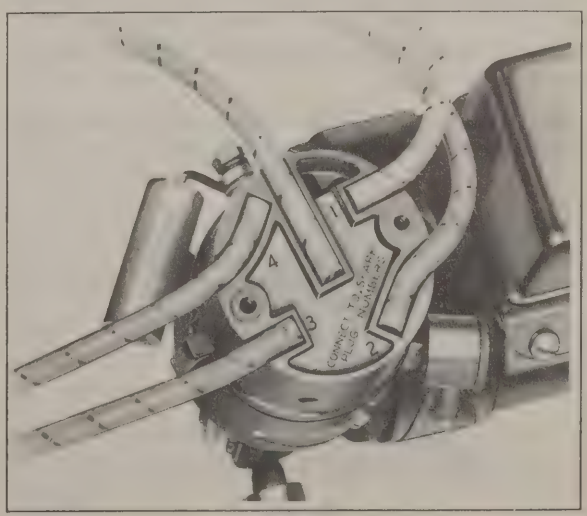


Fig. 17 77932C

The grease cup on the distributor should be given one turn every 64 hours of operation. Use a high melting point grease. Do not over lubricate, otherwise grease will enter the generator and the distributor and may cause trouble.

FIRING ORDER

The firing order of the cylinder is 1-3-4-2. Number 1 cylinder is the one nearest to the flywheel in the left bank of cylinders, when viewed from the flywheel end of the engine. Number 3 cylinder is the other cylinder in this bank. Number 2 cylinder is the one nearest to the flywheel in the right bank of cylinders and Number 4 is the other cylinder in this bank. The cylinders are numbered from 1 to 4 on the air shroud near the spark plugs. See Fig. 2. The flywheel end of the engine is designated the front end, and the power take-off end, the rear end of the engine.

As these engines are of the V type, the interval between firing of the cylinders is as follows:—Crankshaft rotation between firing of cylinders No. 1 and No. 3 is 180°; between No. 3 and No. 4 is 270°; between No. 4 and No. 2 is 180° and between No. 2 and No. 1 is 90°.

SPARK PLUGS

The spark plug gap should be twenty-five thousandths (.025) of an inch, and plugs should be kept clean both inside and out. See Fig. 18. If the porcelain insulator is cracked replace with a new plug of correct heat range, like Champion No. 8 Com., AC #85 or equal. The spark thread is 18 millimeter. Be sure to use a good gasket under the spark plug.

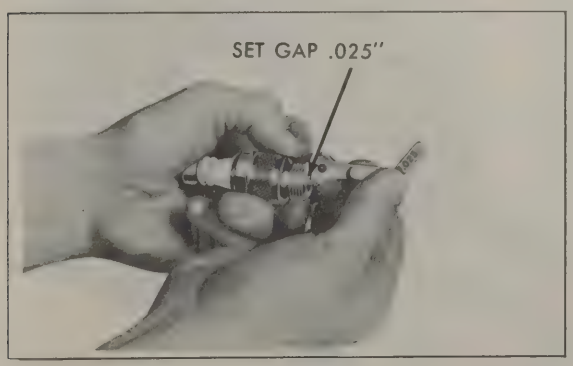


Fig. 18 104713C

ELECTRIC STARTER

The electric starter is an optional accessory, furnished only upon request when engine is purchased. The starter and generator cannot be mounted in the field unless provisions were made when engine was purchased. The starter and generator are products of the Electric Auto-Lite Company, Toledo, Ohio, and it is recommended that all repairs for this accessory be done through their authorized Service Stations. For wiring diagram, see Fig. 14. Battery is not furnished by engine manufacturer.

STARTING

The engine, less electric starter, is started by applying the crank as shown in Fig. 3 and pulling up briskly on the crank in a clockwise direction. DO NOT attempt to spin the engine with the starting crank. If the engine does not start on the first pull up of the crank re-engage the crank and repeat the operation.

RESTORING COMPRESSION

On a new engine or on one which has been out of operation for some time the oil may have drained off the cylinder so that compression will be weak. This may cause difficulty in starting. To remedy this condition, remove the spark plugs and pour about a fluid ounce of crankcase oil through the spark plug hole into each cylinder.

Turn the engine over several times with the starting crank to distribute the oil over the cylinder wall. Then replace the spark plugs and compression should be satisfactory.

TO STOP ENGINE

Engines, less house, have a stop button on the side of the magneto. On these, to stop engine, depress stop button and hold down until engine stops. See Fig. 1. Others with house have an ignition switch on front panel of house as shown in Fig. 2. On these, to stop engine with magneto ignition, pull out the switch; with battery ignition, push in the switch.

SPECIAL INSTRUCTIONS FOR AGRICULTURAL ENGINES

KEEP YOUR ENGINE CLEAN

This engine is cooled by blasts of air which must be allowed to circulate all around the engine cylinders and cylinder heads in order to properly cool the engine and thereby keep it in good running condition. If dust or chaff is allowed to collect in the cylinder shrouding or in the V between the cylinders it will retard the flow of air and cause the engine to overheat.

In the Figs. 19 and 20, we are pointing out the few necessary cleaning precautions which must be followed to insure satisfactory engine performance and engine life.

1 Remove these covers frequently and clean out all dust and chaff. Be sure to replace covers.

2 Open these covers frequently and clean out all dust and chaff. Be sure to close covers.

3 Keep this space between cylinders free of dust and chaff.

4 Read instructions on this air cleaner regarding its care. This is important.

5 Do not allow shrouding to become damaged or badly dented as this will retard air flow.

NEVER OPERATE ENGINE WITH AIR SHROUDING REMOVED BECAUSE THIS WILL RETARD THE AIR COOLING.

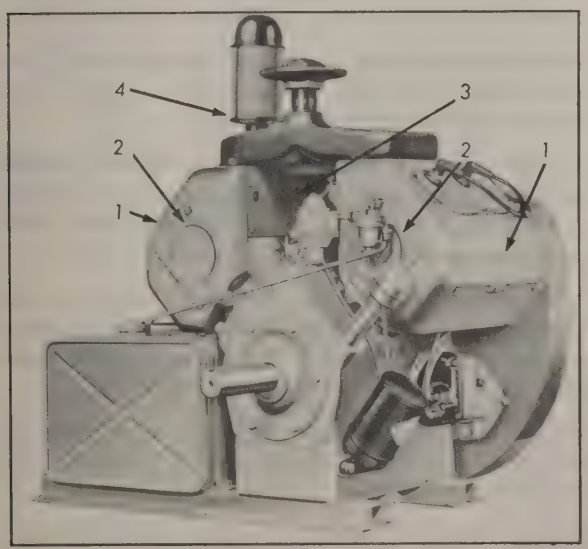


Fig. 19 104566C

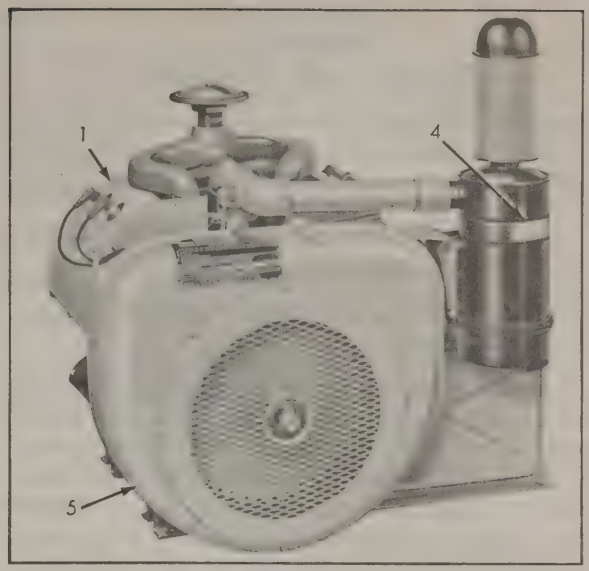


Fig. 20 104714C

SAFETY PRECAUTIONS

Never fill fuel tank while engine is in operation or hot, as danger from fire would be incurred.

Never operate engine in a closed building unless the exhaust is piped outside. Exhaust from an engine contains carbon monoxide, a poisonous, odorless and invisible gas, which if breathed into the lungs would cause serious illness and possible death.

Never make adjustments on any kind of machinery while it is connected to the engine, without first removing the ignition cables from the spark plug. Turning over the machinery by hand during adjusting or cleaning might start the engine and the machinery with it causing serious injury to the operator.

ALWAYS KEEP ALL PARTS OF THE ENGINE CLEAN. THIS WILL PROLONG ENGINE LIFE, AND GIVE MORE SATISFACTORY OPERATION.

EVERY 4 TO 8 HOURS Depending on dust conditions, check air cleaner and change oil. See page 8 .

EVERY 8 HOURS Check crankcase oil level. Keep filled to FULL mark on oil gauge sabre, but no more. See Fig. 4.

EVERY 50 HOURS Drain crankcase and refill with fresh oil. See Lubrication. Pages 6 and 8.

EVERY 300 HOURS Replace oil filter element. See Page 8 .

TROUBLES
CAUSES AND REMEDIES

Three prime requisites are essential to starting and maintaining satisfactory operation of gasoline engines. They are:

1. A PROPER FUEL MIXTURE in the cylinder.
2. GOOD COMPRESSION in the cylinder.
3. GOOD SPARK, PROPERLY TIMED, to ignite the mixture.

If all three of these conditions do not exist the engine cannot be started. There are other factors which will contribute to hard starting; such as, too heavy a load for the engine to turn over at a low starting speed, a long exhaust pipe with high back pressure, etc. These conditions may affect the starting, but do not necessarily mean that the engine is improperly adjusted.

As a guide to locating any difficulties which might arise the following causes are listed under the three headings: FUEL MIXTURE—COMPRESSION—IGNITION.
In each case the causes of trouble are given in the order in which they are most apt to occur. In many cases the remedy is apparent, and in such cases no further remedies are suggested.

STARTING DIFFICULTIES

FUEL MIXTURE

No fuel in tank or fuel shut off valve closed.

Fuel pump diaphragm worn out, so pump does not supply carburetor with fuel.

Carburetor not choked sufficiently, especially if engine is cold. See "Choke" Page 10.

Water, dirt, or gum in gasoline interfering with free flow of fuel to carburetor.

Poor grade or stale gasoline that will not vaporize sufficiently to form the proper fuel mixture.

Carburetor flooded, caused by too much choking especially if engine is hot. See "Choke" Page 10.

Dirt or gum holding float needle valve in carburetor open. This condition would be indicated if fuel continues to drip from carburetor with engine standing idle. Often tapping the float chamber of the carburetor very lightly with the wood handle of a screw driver or similar instrument will remedy this trouble. Do not strike carburetor with any metal tools, it may be damaged. Also if the mixture in the cylinder, due to flooding, is not too rich to start the engine, starting should be tried, as it will usually correct the trouble. In this case the choke should be left open.

If, due to flooding, too much fuel should have entered the cylinder in attempting to start the engine, the mixture will most likely be too rich to burn. In that case the spark plugs should be removed from the cylinders and the engine then turned over several times with the starting crank, so the rich mixture will be blown out through the spark plug holes. The choke on the carburetor should of course be left open during this procedure. The plugs should then be replaced and starting tried again.

To test for clogged fuel line, loosen fuel line nut at carburetor slightly. If line is open, fuel should drip out at loosened nut.

COMPRESSION

If the engine has proper compression, considerable resistance will be encountered in the pull on the starting crank. If this resistance is not encountered compression is faulty. Following are some reasons for poor compression:—

Cylinder dry due to engine having been out of use for some time. See "Restoring Compression" Page 16.

Loose spark plugs or broken spark plug. In this case a hissing noise will be heard in cranking engine, due to escaping gas mixture on compression stroke.

Damaged cylinder head gasket or loose cylinder head. This will likewise cause hissing noise on compression stroke.

Valve stuck open due to carbon or gum on valve stem. To clean valve stems, see "Valves" Page 25.

Valve tappers adjusted with insufficient clearance under valve stems. See "Valve Tapper Adjustment" Page 26.

Piston rings stuck in piston due to carbon accumulation. If rings are stuck very tight this will necessitate removing piston and connecting rod assembly and cleaning parts. See "Piston and Connecting Rod" Page 23.

Scored cylinders. This will require reboring of the cylinders and fitting with new pistons and rings. If scored too severely an entirely new cylinder block may be necessary.

IGNITION

See "Magneto Ignition Spark" Page 11, or "Battery Ignition Distributor" Page 12. No spark may also be attributed to the following:--

Ignition cable disconnected from magneto or spark plugs.

Broken ignition cables, causing short circuits.

Ignition cables wet or soaked.

Spark plug insulators broken.

Spark plugs wet or dirty.

Spark plug point gap wrong. Should be .025".

Condensation on spark plug electrodes.

Magneto or Distributor breaker points pitted or fused.

Magneto or Distributor breaker arm sticking.

Magneto or Distributor condenser leaking or grounded.

Spark timing wrong. See "Magneto Timing" Page 12, or "Battery Ignition Distributor" Page 12.

ENGINE MISSES

Spark plug gap incorrect. Should be .025".

Worn and leaking ignition cables.

Weak spark. See "Magneto Ignition Spark" Page 11, or "Battery Ignition Distributor" Page 12.

Loose connections at ignition cable.

Magneto or Distributor breaker points pitted or worn.

Water in gasoline.

Poor compression. See "Compression" Page 16.

ENGINE SURGES OR GALLOPS

Carburetor flooding.

Governor spring hooked into wrong hole in lever. See "Governor" Page 27. Governor rod incorrectly adjusted. See "Governor" Page 26.

ENGINE STOPS

Fuel tank empty.

Water, dirt or gum in gasoline.

Gasoline vaporized in fuel lines due to excessive heat around engine (Vapor Lock).

Vapor lock in fuel lines or carburetor due to using winter gas (too volatile) in hot weather.

Air vent hole in fuel tank cap plugged. Engine scored or stuck due to lack of oil.

Ignition troubles. See "Ignition" on this page.

ENGINE OVERHEATS

Crankcase oil supply low. Replenish immediately.

Ignition spark timed wrong. See "Magneto Timing" Page 12, or "Battery Ignition Distributor" Page 12.

Low grade of gasoline.

Engine overloaded.

Restricted cooling air circulation.

Part of air shroud removed from engine.

Dirt between cooling fins on cylinder or head.

Engine operated in confined space where cooling air is continually recirculated, consequently becoming too hot.

Carbon in engine.

Dirty or incorrect grade of crankcase oil.

Restricted exhaust.

Engine operated while detonating due to low octane gasoline or heavy load at low speed.

ENGINE KNOCKS

Poor grade of gasoline or of low octane rating. SEE "FUEL", Page 9.

Engine operating under heavy load at low speed.

Carbon or lead deposits in cylinder head.

Spark advanced too far. See "Ignition Timing" Page 12, or "Battery Ignition Distributor" Page 12.

Loose or burnt out connecting rod bearing.

Engine overheated due to causes under previous heading.

Worn or loose piston pin.

ENGINE BACKFIRES THROUGH CARBURETOR

Water or dirt in gasoline.

Engine cold.

Poor grade of gasoline.

Sticky inlet valves. See "Valves" Page 25.

Overheated valves.

Spark plugs too hot. See "Spark plug" Page16.

Hot carbon particles in engine.

DISASSEMBLING AND REASSEMBLING ENGINES

Engine repairs should be made only by a mechanic who has had experience in such work. When disassembling the engine it is advisable to have several boxes available so that parts belonging to certain groups can be kept together, such as, for instance, the cylinder head bolts, etc. Bolts of various lengths are used in the engine, therefore great care must be exercised in reassembly so the right bolts will be used in the various places, otherwise damage may result.

While the engine is partly or fully dismantled all of the parts should be thoroughly cleaned. Remove all accumulated dirt between the fins.

If it is desired to disassemble the engine the following order should be substantially adhered to. As disassembly progresses, the order may be altered somewhat if desired, as will be self-evident to the mechanic. Reassembly of the engine should be made in the reverse order.

ACCESSORIES

The Air Cleaner, Magneto, and if an electric starter and generator are used these should be removed first.

SHEET METAL HOUSE

With engines enclosed in a sheet metal house, the top cover or canopy of the house should be removed by taking out the screws holding it to the end panels. For removing end panels see following paragraphs.

FLYWHEEL

It is necessary that the flywheel be removed next. After the flywheel screen has been removed, the flywheel nut should be taken off as shown in Fig. 21. Then as shown

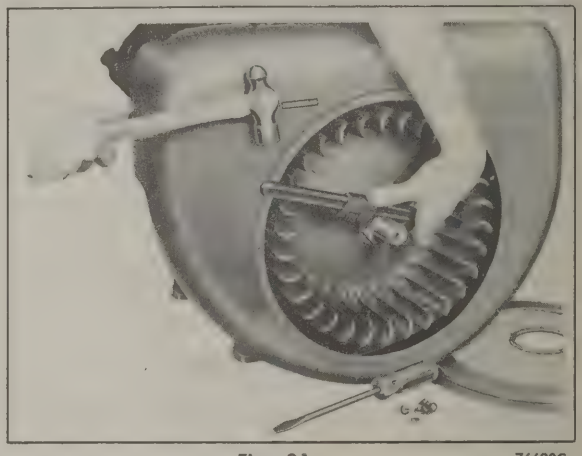


Fig. 21 76690C

in Fig. 22 the flywheel can be removed from the crankshaft by tapping the end of the crankshaft with a babbitt hammer. Do not use a hard hammer as it would ruin the crankshaft and bearings.

Fig. 22 76696C

AIR SHROUDING

To disassemble air shrouding, (see Figs. 23 to 25) first remove cylinder head covers and the screws mounting the flywheel shroud to lower cylinder shrouds and cylinder heat deflectors, then remove the screws holding the flywheel shroud to gear cover. When complete engine house is disassembled, remove the front end panel as shown in Fig. 23 together with flywheel shroud and the rear end panel, see Fig. 24, complete with fuel tank. Balance of shrouding can now be readily removed.

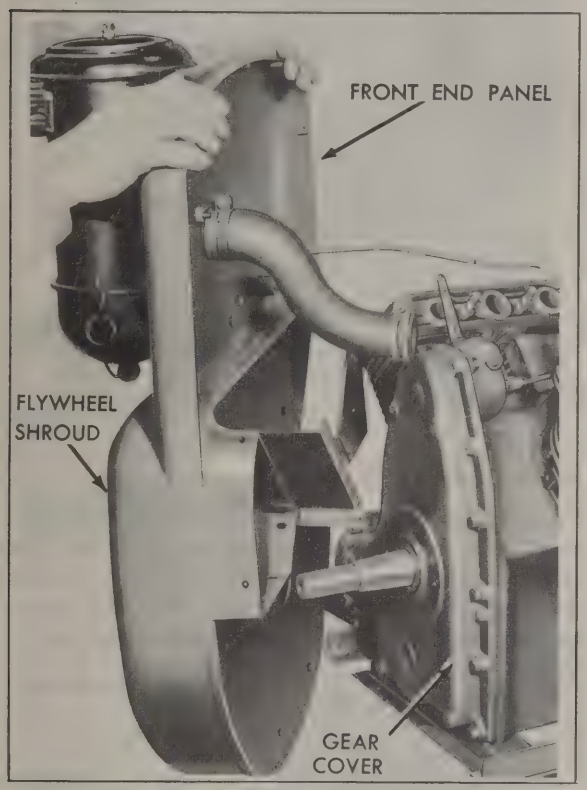


Fig. 23 104719C

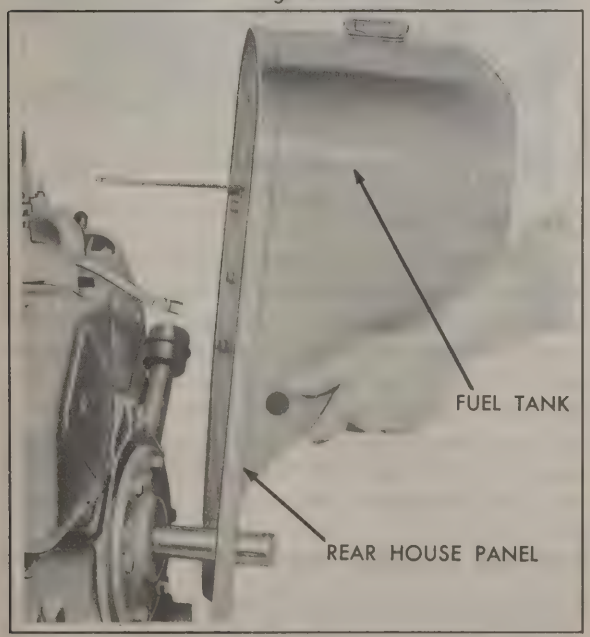


Fig. 24 71050C

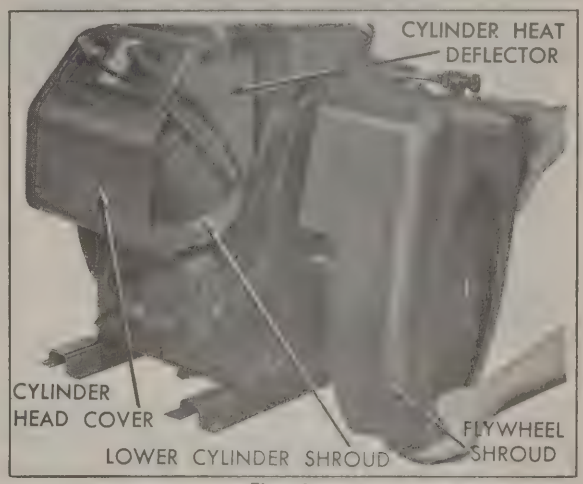


Fig. 25 104811C

GAS TANK

If a side mount gasoline tank is used this should be removed next. See Fig. 26.

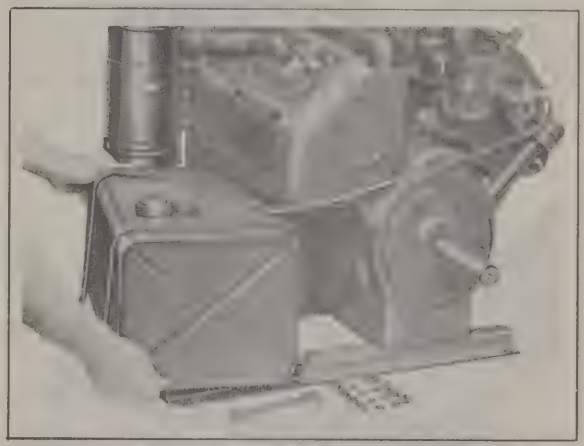


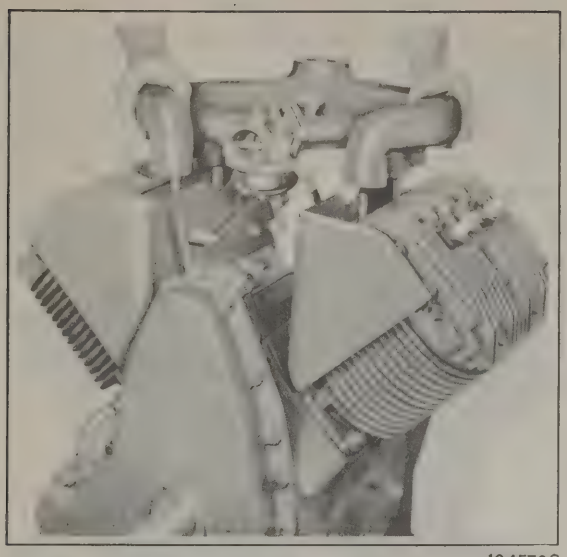
Fig. 26 83608C

CARBURETOR AND MANIFOLDS

The carburetor and manifolds can then be removed in sections as shown in Fig. 27.

CYLINDER HEAD

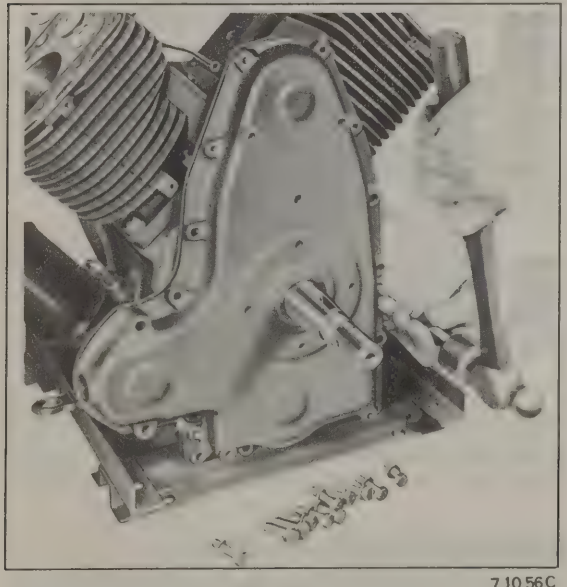
The cylinder head must be removed if it is necessary to regrind valves, or to do work on the piston rings or connecting rod. All of the cylinder head bolts are plainly in view and can be easily removed. Bolts of different lengths are used but these can be properly reassembled according to the various lengths of cylinder head bosses.



104579C

Fig. 27

Before reassembling the cylinder head, all carbon and lead deposits should be removed. It is recommended that a new cylinder head gasket be used on reassembly as the old gasket will be compressed and hard so that it may not seal properly.

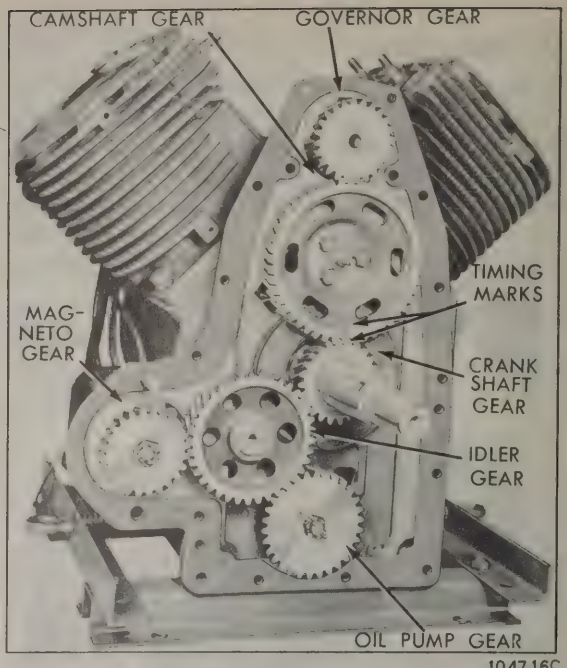


7 1056C

Fig. 28

GEAR COVER

Disengage the governor linkage as described on page 26 before removing gear cover, since the same mounting bolts for governor housing and gear cover are used. Remove gear cover bolts and drive out two dowel pins as shown in Fig. 28. The cover can then be removed exposing the timing gears as shown in Fig. 29.

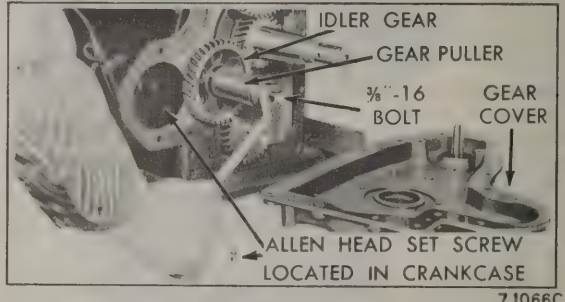


1047 16C

Fig. 29

IDLER GEAR AND SHAFT

Remove the Allen-head set screw on the magneto side of the crankcase which locks the idler shaft in position. With the use of a gear puller, the idler shaft and idler gear assembly can be removed from the crankcase. See Fig. 30.



7 1066C

Fig. 30

CAMSHAFT GEAR

Remove the three cap screws and lock washers which hold the gear to the end of the camshaft. Note that the mounting holes in the camshaft gear are staggered in such a manner that the gear can be assembled to the shaft only one way which will automatically time the gear to the shaft. Pry the gear off the camshaft using a screw driver or similar wedge tool.

OIL PAN (See Fig. 31)

The engine can then be inverted so that the supports and oil pan can be removed.

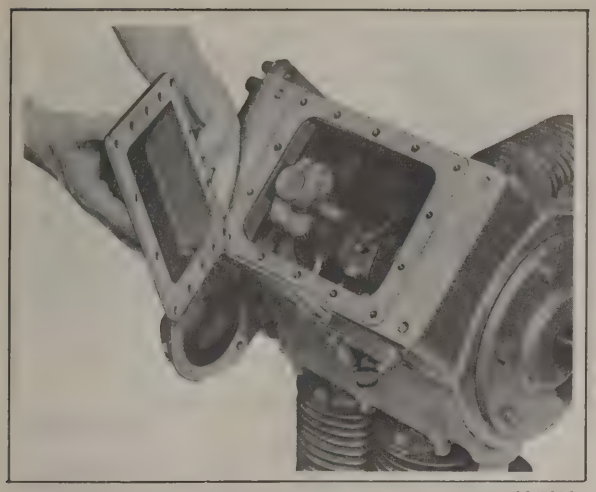


Fig. 31 104721C

OIL PUMP

To remove oil pump, first take out the slotted pipe plug, and then the oil pump lock-screw as shown in Fig. 32. Remove

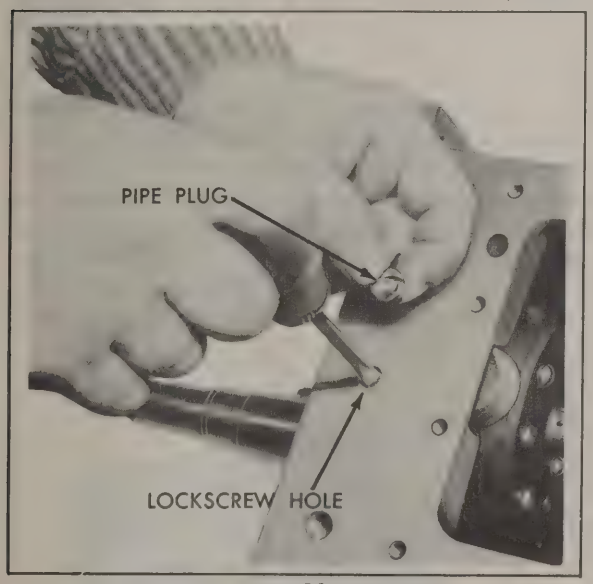


Fig. 32 71054C

cotter pin and nut holding oil pump driving gear to shaft. Then, with soft brass rod or punch, drive shaft through gear as shown in Fig. 33. The oil pump can then be withdrawn toward center of crankcase.

PISTONS AND CONNECTING RODS

After removal of the oil pump, all of the connecting rod bolts will be accessible. The nuts should be removed from the bolts, then by tapping the ends of the bolts lightly, being careful not to mar the threads, the connecting rod caps can be freed from

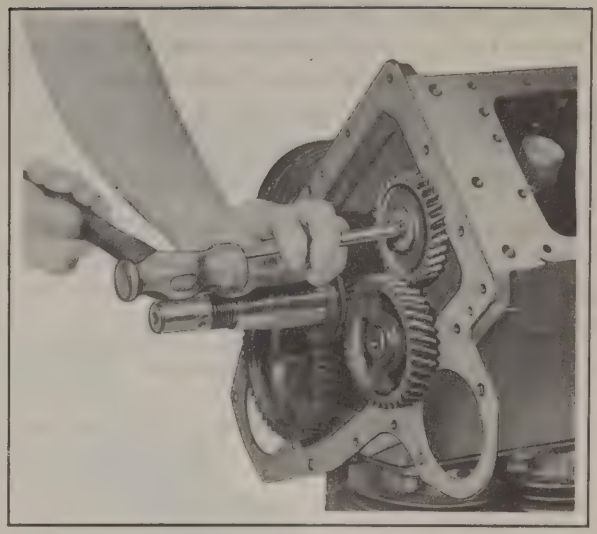


Fig. 33 83615C

the bolts. Be very careful that all shims will be kept in their places. After the caps are removed the nuts should be immediately put back on the bolts so none of the shims will be displaced. The connecting rods with the pistons can now be pushed through the cylinders. The caps should now be put back on the rods. Always be sure the caps are replaced in the exact position as when removed, according to the numbers stamped on the side of the rod and cap. See Fig. 34.

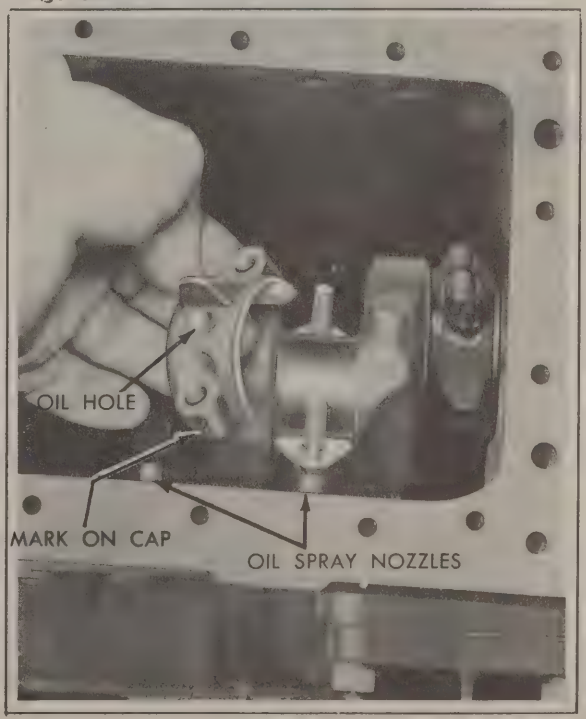


Fig. 34 104819C

When assembling piston to connecting rod, the split side of piston should be on the opposite side of the rod to the oil hole in the connecting rod cap. See Fig. 3.

When reassembling the engine, be sure the oil hole in the connecting rod cap is toward the oil spray nozzle. See Fig. 34.

Be sure the pistons are put back into the same bore from which they were removed.

PISTON RINGS — IMPORTANT

Rings should be assembled to pistons as shown in Fig. 35. The scraper and oil rings must be assembled to the pistons with the scraper edge down, otherwise oil pumping will result. See Fig. 36.

71152C

Fig. 35

PISTON, RING AND ROD CLEARANCES

MODELS		VM4	VP4
Piston to Cylinder at Piston Skirt		.004 to .0045	.004 to .0045
Piston Ring Gap		.017	.017
Piston Ring Side Clearance in Grooves	Top Ring	.0015 to .003	.0015 to .003
	2nd Ring	.0015 to .003	.0015 to .003
	Scraper Ring	.0015 to .003	.0015 to .003
	Oil Ring	.0025 to .004	.0025 to .004
Rod to Shaft	Diameter	.001 to .002	.001 to .002
	Side	.007 to .014	.007 to .014
Piston Pin to Connecting Rod Bushing		.0005 to .001	.0005 to .001

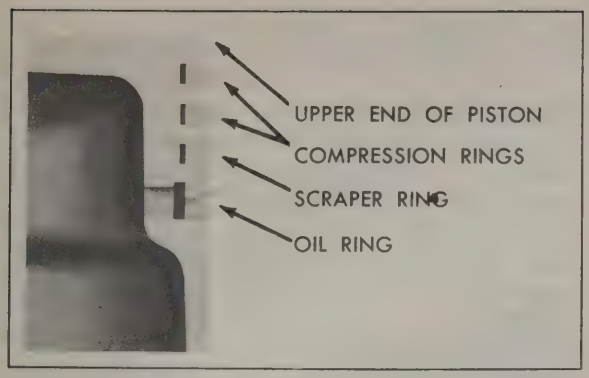


Fig. 36 92200C

CYLINDERS

The cylinders can now be removed from the crankcase if necessary. In reassembling, put the blocks back on the same side from which they were removed. Clean all dirt and other deposits from fins before reassembling. If the cylinders are worn more than .005 inch over size, they should be reground and fitted with oversize pistons and rings.

VALVES

Remove valve tapper inspection plate. Compress valve springs with a valve lifter. The valve spring retainer locks should then be removed from the valve stems. The valves can then be withdrawn from the top of the cylinder block. See Fig. 37. The valves,

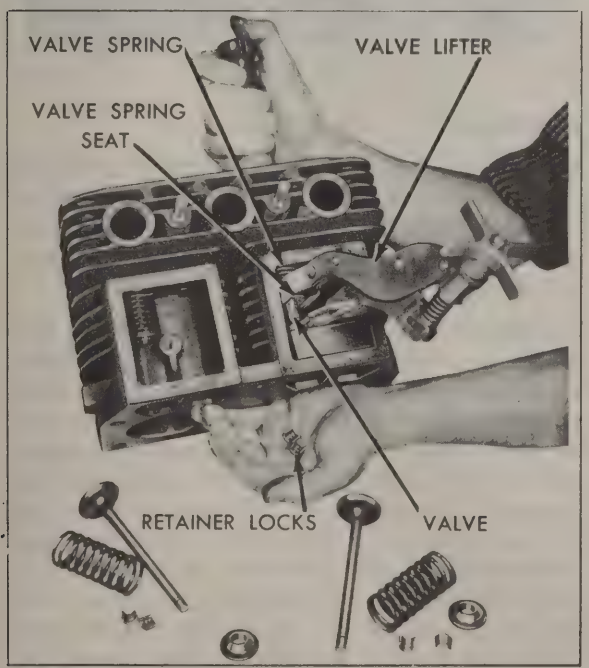
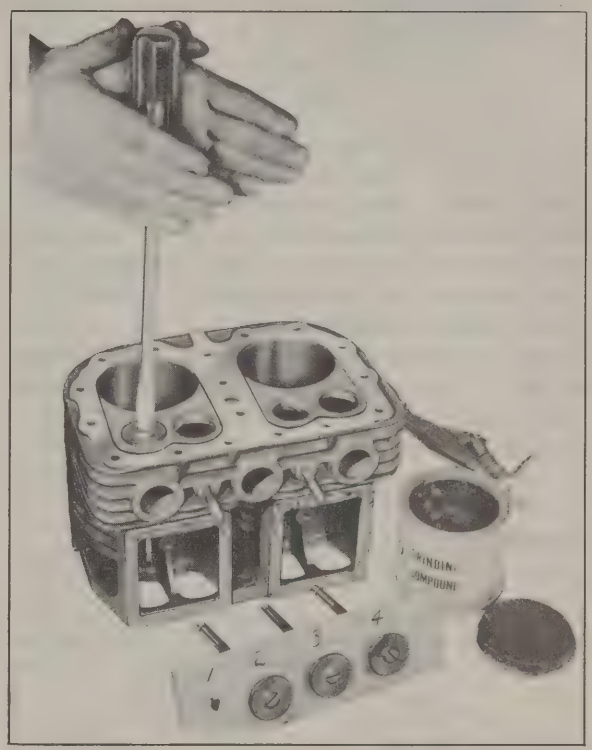


Fig. 37 71073C

valve seats, ports and guides in the cyinder block, should be cleaned of all carbon and gum deposits.

The valve seats should be reground to a good seat by spreading a small quantity of fine valve grinding compound on the valve and then rubbing the valve on its seat by a back and forth motion with a screw driver (vacuum cup tool if valves do not have a slot) or a reciprocating advancing valve grinding tool. Occasionally rotate valve to another position during the grinding operation so seat will be ground true. See Fig. 38. A uniform seat about 3/32"



71071C

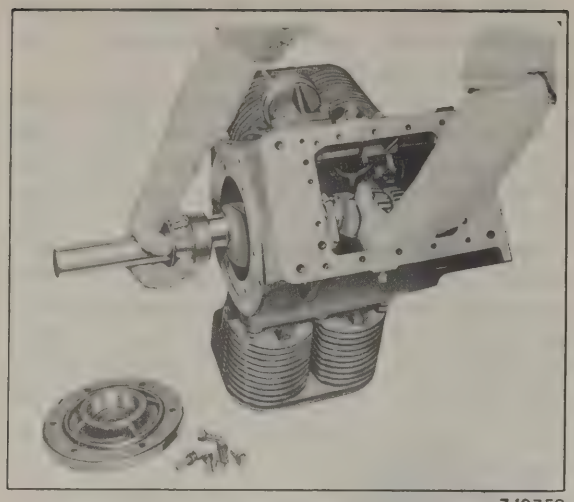
Fig. 38

wide should show entirely around the valves. All grinding compound should be carefully washed off the valves and cylinder block with gasoline or kerosene.

The valve stems should have a clearance of .004" in the guides.

CRANKSHAFT

To remove the crankshaft, first remove the four bolts in the bearing retainer plate on end of engine opposite flywheel. This plate can then be pried off, and crankshaft removed from that end of crankcase. Be sure to keep shims in place. See Fig. 39.



71075C

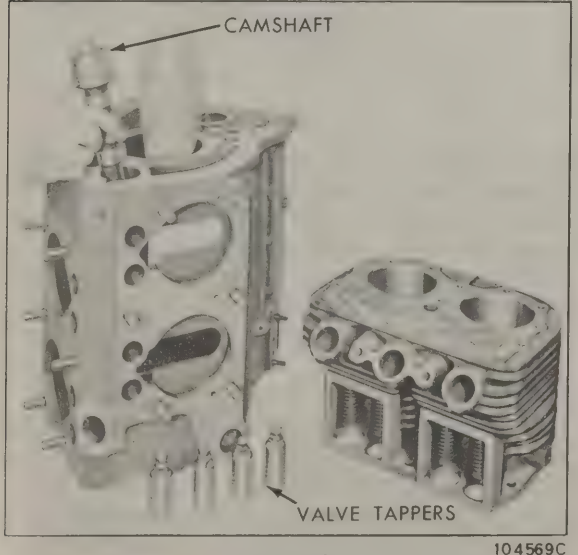
Fig. 39

The shims are used to give the proper end play to the Timken main bearings on the crankshaft. This end play should be .002 to .004 inch when engine is cold. There is practically no wear in these Timken bearings so that no readjustment is necessary after proper assembly.

When reassembling crankshaft, the timing marks on the crankshaft gear and the camshaft gear must be matched (See Fig. 30), otherwise engine will not operate properly, or if timing is off considerably, engine will not run at all.

CAMSHAFT

After removing the valve tappers, the camshaft can be withdrawn from the flywheel end of the engine. See Fig. 40. When replacing, be sure the spring and plunger are in place in the end of the camshaft, as these hold the camshaft in position endwise. See Fig. 3.



104569C

Fig. 40

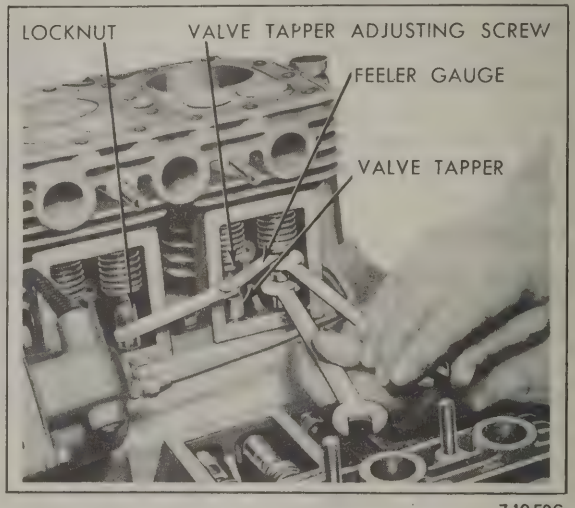
VALVE TAPPERS

The valve tappers must be pulled out before the camshaft is removed. In reassembly, they are inserted in the crankcase after the camshaft is reassembled.

After the cylinders have been reassembled, the tapper should be adjusted, when cold, to a clearance:

Std. Inlet and Exhaust Valves - .011" to .013"
Stellite Exhaust Valves - .016" to .018"

Engines having Stellite exhaust valves and inserts are designated as Models VM4D and VP4D. Carefully check the model designation on name plate, when adjusting tappers. See Fig. 41.



71059C

Fig. 41

GOVERNOR

The centrifugal flyball governor rotates on a stationary pin driven into the upper part of the timing gear cover, and the governor is driven off the camshaft gear at crankshaft speed.

The flyweights are hinged to lugs on the gear. Hardened pins on the flyweights bear against the flanged sliding sleeve, moving it back and forth as the flyweights move in or out. The motion of the sleeve is transmitted through a ball thrust bearing to the governor lever, which in turn is connected to the carburetor throttle lever. A spring connected to the governor lever tends to hold the governor flyweights to their inner position, also to hold the carburetor throttle open. As the engine speed increases the centrifugal force in the flyweights acts against the spring and closes

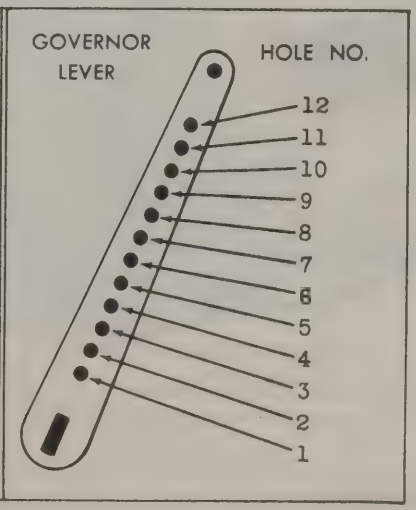
the throttle to a point where the engine speed will be maintained practically constant under varying load conditions. This speed can be varied to suit conditions by adjusting the governor spring to suit.

The connecting link between the governor and carburetor must be adjusted to the proper length otherwise the governor action will be faulty. With the engine at rest the governor spring will hold the flyweights "in", and the connecting link must be of such length as to hold the carburetor throttle wide open at that point. The accuracy of this adjustment can be tested by disconnecting the link from the governor lever, and then pushing the link toward the carburetor as far as it will go. This will open the throttle wide. The bent end of the link should then exactly register with the hole in the governor lever. If it does not, the link should be screwed into or out of the swivel block on the carburetor lever, until the above mentioned registry is attained. The link should then be again connected to the governor lever. If this adjustment is not made accurately the governor may cause the engine speed to surge or otherwise be unsatisfactory.

The governor can be disassembled from the engine by first removing the governor housing, after which the entire governor can be withdrawn from the stationary pin. The construction of the governor can be best seen from the sectional drawing of the engine, Fig. 3.

The governor lever is furnished with 12 holes, as shown in the following table, for attaching the governor spring. It is very important that the spring is hooked into the proper hole to suit the speed at which the engine is operated. A table is given herewith showing the full load and no load speeds of the engine and the hole corresponding thereto. The full load speed will be from 150 to 125 revolutions less than the no load speed. As an example, if the engine is to be operated at 2125 revolutions per minute without load, the spring should be hooked into the 8th hole in the governor lever and the spring tension adjusted by means of the adjusting screw on the spring to run 2125 revolutions per minute. The speed at full load will then be approximately 2000 revolutions per minute.

LOAD R.P.M.	NO LOAD R.P.M.	Hole No.
1400	1550	4
1500	1650	5
1600	1725	5
1700	1850	6
1800	1950	7
1900	2050	8
2000	2125	8
2100	2250	9
2200	2350	10



CLUTCH TAKE-OFF AND REDUCTION GEARS

FOR MODELS VM4 AND VP4 ENGINES

CLUTCH TAKE-OFF

The clutch furnished with the VM4 and VP4 engines is of the dry disc type. No oil should be put into the clutch housing. There are three points on these clutches requiring lubrication. These three points are filled with grease at the factory and THREE GREASE GUN FITTINGS are furnished for periodic lubrication. The housing bearing and the pilot bearing should receive additional grease every fifty hours of operation. The clutch throwout bearing should be greased every day before starting. Use Mobil Gargoyle grease BRB#3, or Sinclair AF-1 grease, or equal. See Fig. 42.

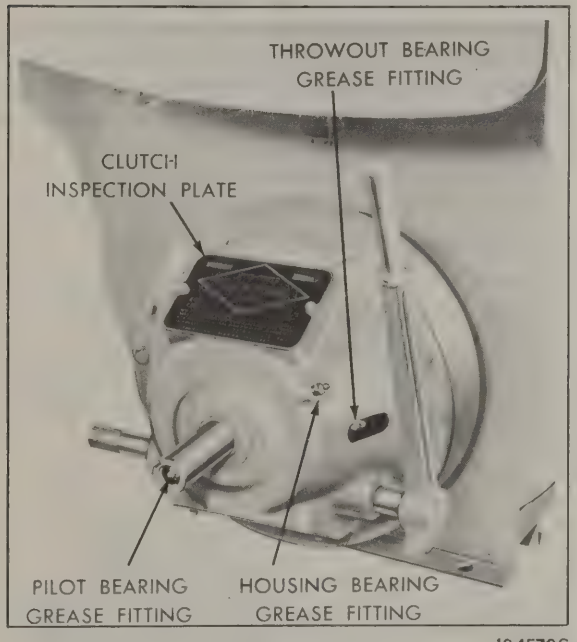


Fig. 42 104570C

CLUTCH ADJUSTMENT

If the clutch begins to slip it should be readjusted, otherwise it would become overheated and damaged. First release clutch operating lever and remove clutch inspection plate. Then turn clutch over until ADJUSTING RING LOCK is up. Release lock with a screw driver or similar tool as shown in Fig. 43. The adjusting ring should then be turned in a clockwise direction

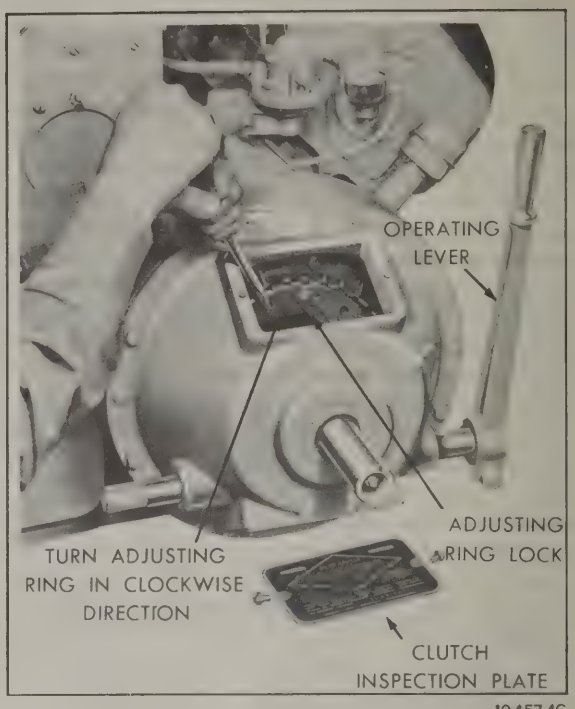


Fig. 43 104574C

one notch at a time until a very firm pressure is required to engage the clutch by the operating lever. Be sure to re-engage the adjusting ring lock into a notch in the ring. Replace inspection cover.

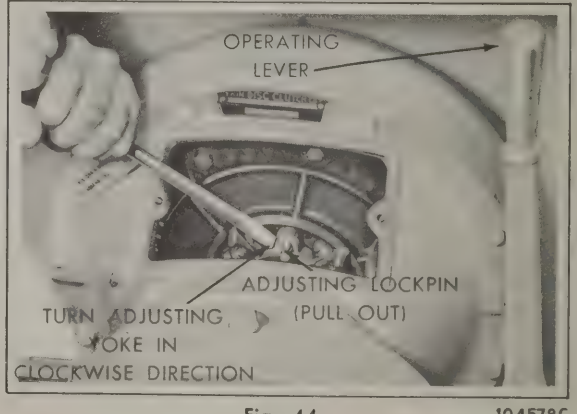


Fig. 44 104578C

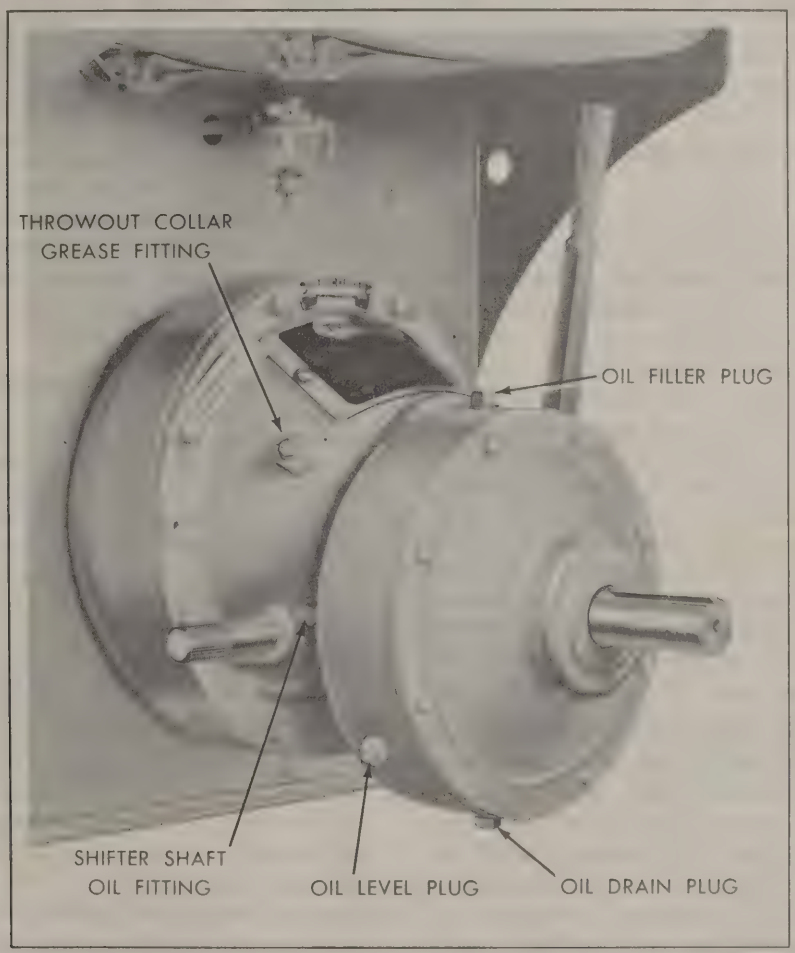
CLUTCH REDUCTION GEARS

Clutch reduction gears are furnished with several different ratios, some with spur gears, for counter-enginewise rotation,

others with internal gears, for engine-wise rotation. The clutch is of the dry disc type and no oil should be put into the clutch housing. Apply a small amount of lubricant to clutch throwout collar once a day before starting. Also oil clutch shifter shaft through oil fittings on each side of housing. See Fig. 45. The clutch shaft pilot bearing and outer bearing are self lubricated with oil in gear case.

If clutch slips, heats, or operating lever jumps out, the clutch must be adjusted. Release clutch operating lever and remove hand hole plate, turn clutch until adjusting lockpin can be reached. Pull adjusting lockpin out and turn the adjusting yoke to the right or clockwise, with screw driver or similar tool, until the operating lever requires a distinct pressure to engage. See Fig. 44. A new clutch generally requires several adjustments until the friction surfaces are worn in.

The reduction gear is operated in oil and the gear case oil level must be maintained to oil level plug. See Fig. 45. In twin disc units high grade transmission oil S.A.E. #90 to #110 Viscosity must be used. For Rockford units use #30 S.A.E. crankcase oil. Change oil every 2000 hours of service while unit is warm.



104576C

Fig. 45

SPECIAL INSTRUCTIONS FOR LAYING UP ENGINE FOR WINTER

When the season's work is completed, the following instructions should be carried out very carefully to protect the engine over winter.

The outside of the engine, including the cooling fins on the cylinders and heads, should be thoroughly cleaned of all dirt and other deposits.

The air cleaner at the carburetor intake should be thoroughly cleaned of all oil and accumulated dust and sediment removed from the oil cup at the bottom of the cleaner.

To protect the cylinders, pistons, rings and valves and keep them from rusting and sticking, a half and half mixture of kerosene and good gas engine oil, (the same kind of oil as used in the crankcase of the engine), should be injected into the pet cock on the intake manifold while the engine is warm and running at moderate speed. About a quarter of a pint is necessary on a four cylinder engine, or enough so that a heavy bluish smoke will appear at the exhaust. The ignition switch should then be shut off and the engine stopped. This operation will give a coating of oil on the above mentioned parts, protecting them from the atmosphere.

On engines where there is no pet cock on the intake manifold, the kerosene and oil mixture may be injected into the air intake on the carburetor while the engine is running, so the mixture will be drawn into the engine. The air cleaner connection will of course have to be disconnected from the carburetor to do this.

All old used oil should be drained from the crankcase while the engine is warm, as the oil will then flow much more freely than when cold.

All exposed unpainted metal parts should be coated with grease or heavy oil.

Before starting the engine again the next season, the crankcase drain plug should again be removed, so that any condensation, which may have collected during the winter, may be drained before new crankcase oil is added.

A good plan, and one that is recommended, is to remove the crankcase bottom cover or oil base in the spring before starting the engine for the new season, and scrubbing off all sediment which may have collected there.

When replacing the bottom cover, a new gasket should be used.

BE SURE TO FILL THE CRANKCASE WITH A GOOD QUALITY OF CRANKCASE OIL TO THE HIGH LEVEL POINT, BEFORE STARTING THE ENGINE. DO NOT USE ANY OIL HEAVIER THAN SAE NO. 30. ALSO BE SURE TO PUT OIL TO THE PROPER LEVEL IN THE AIR CLEANER.

It is also recommended to use new spark plugs at the beginning of the next season, especially if the engine has given considerable service.

It is highly recommended that machines be stored inside a building through the winter. If this is not possible, the engine should be protected from snow and ice by a proper covering.

REPAIR PARTS LIST

READ THESE INSTRUCTIONS BEFORE ORDERING PARTS

THE MODEL, SPEC AND SERIAL NUMBER OF YOUR ENGINE, SHOWN ON THE NAME PLATE ATTACHED TO THE AIR SHROUD, MUST BE GIVEN WHEN ORDERING PARTS

★

TO INSURE PROMPT AND ACCURATE SERVICE, THE FOLLOWING INFORMATION MUST BE GIVEN.

1. State exactly quantity of each part and part number.
2. State definitely whether parts are to be shipped by express, freight or parcel post.

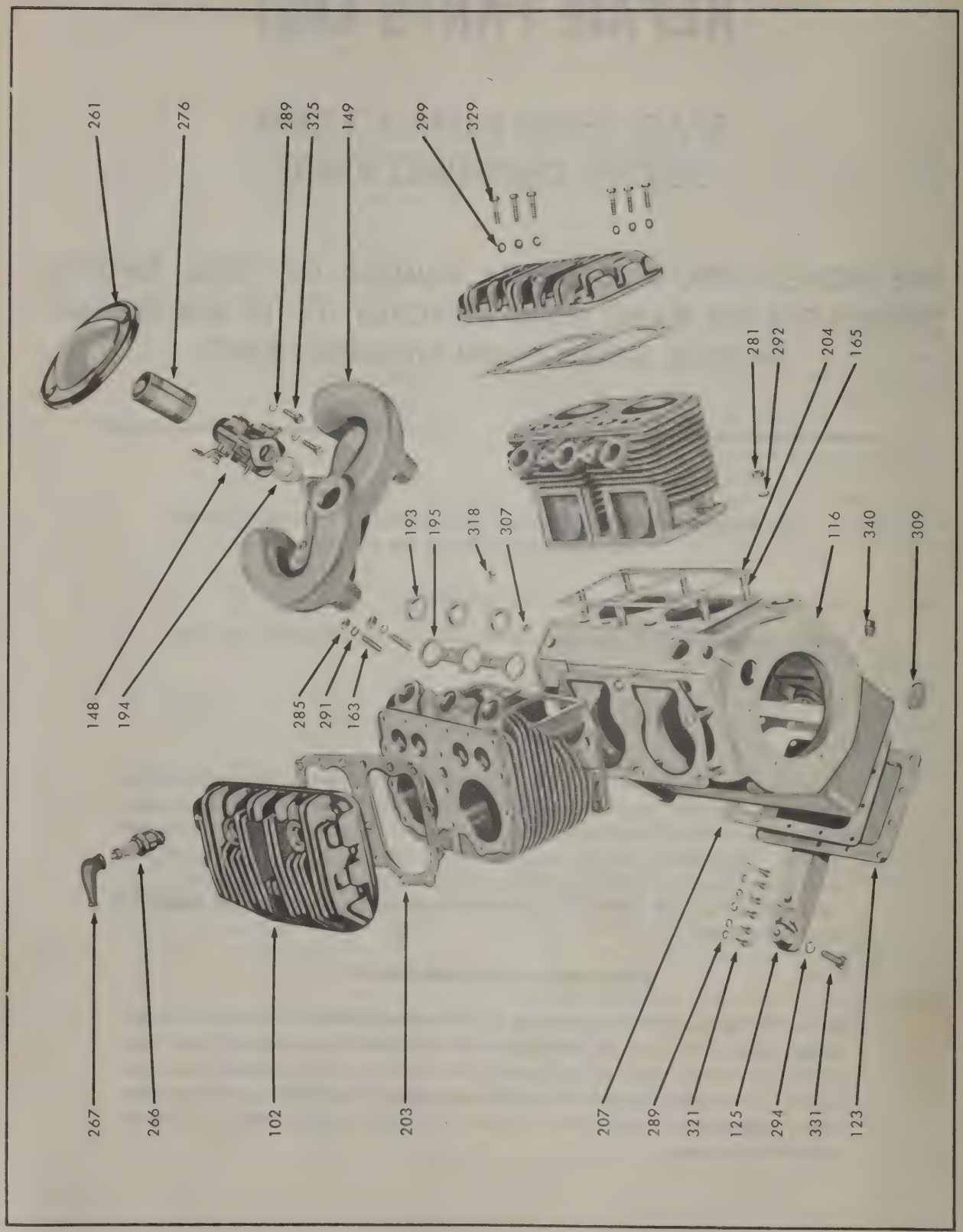
SERVICE FACILITIES

Approved engine service stations, located throughout the U. S. and foreign countries, have been carefully selected by the **WISCONSIN MOTOR CORPORATION** in order to assure complete and efficient repair and inspection service to owners of Wisconsin Air-Cooled Engines. These service stations, equipped and trained for complete engine repair, also stock parts to facilitate immediate delivery for all Wisconsin Air-Cooled Engines.

A DIRECTORY OF SERVICE STATIONS CAN BE FOUND IN THE BACK OF THIS MANUAL.

PARTS RETURNED FOR CREDIT

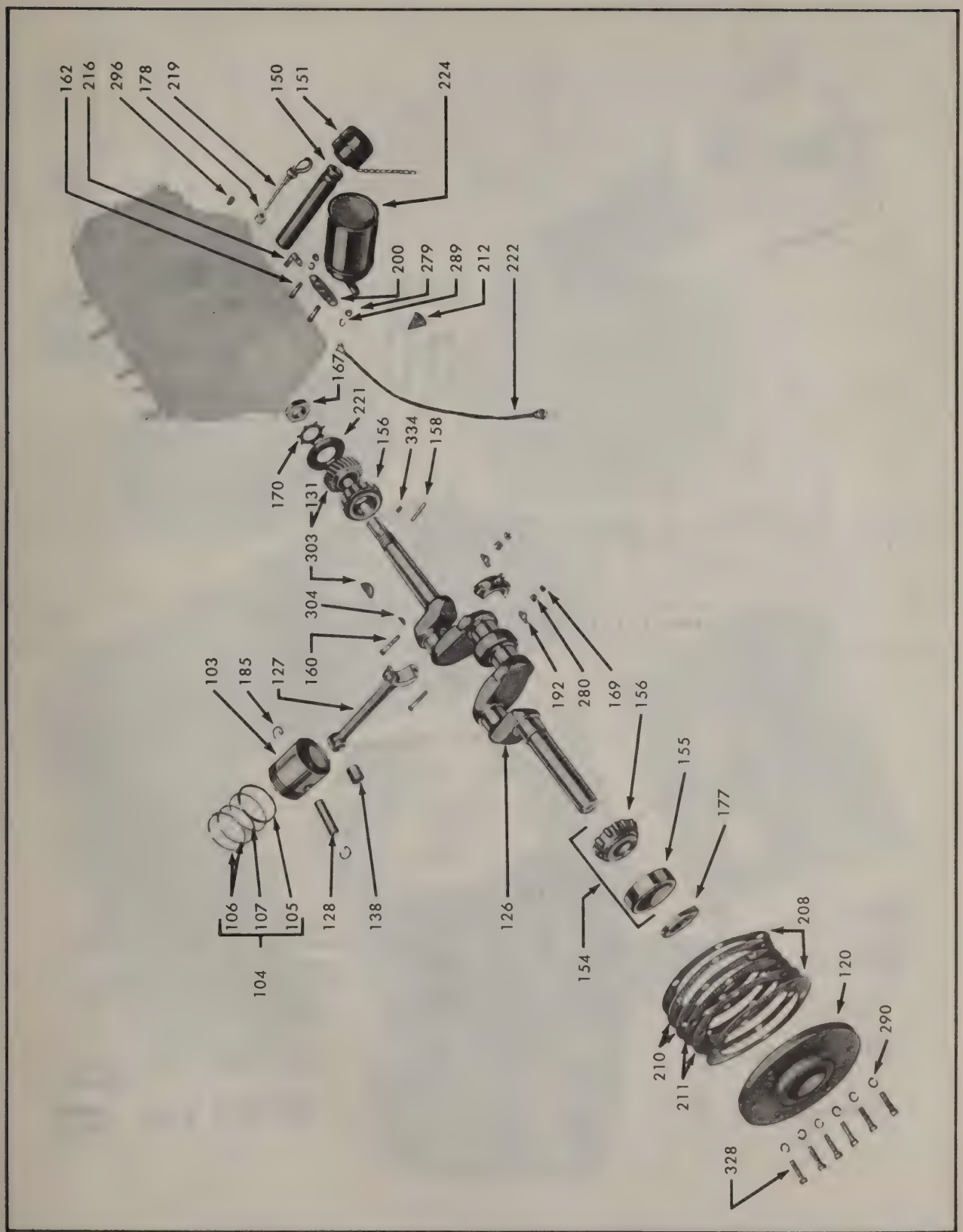
Before returning any parts, write a letter to the company from whom the parts were purchased, giving an exact list and description of the materials, why you wish to return them, whether for repairs, credit, or replacement, and also the model, specification and serial numbers of the engine from which the parts were taken. If authority is granted for their return, transportation charges must be prepaid and sender's name marked on the outside of the box or package.



MANIFOLD AND CRANKCASE GROUP

129784C

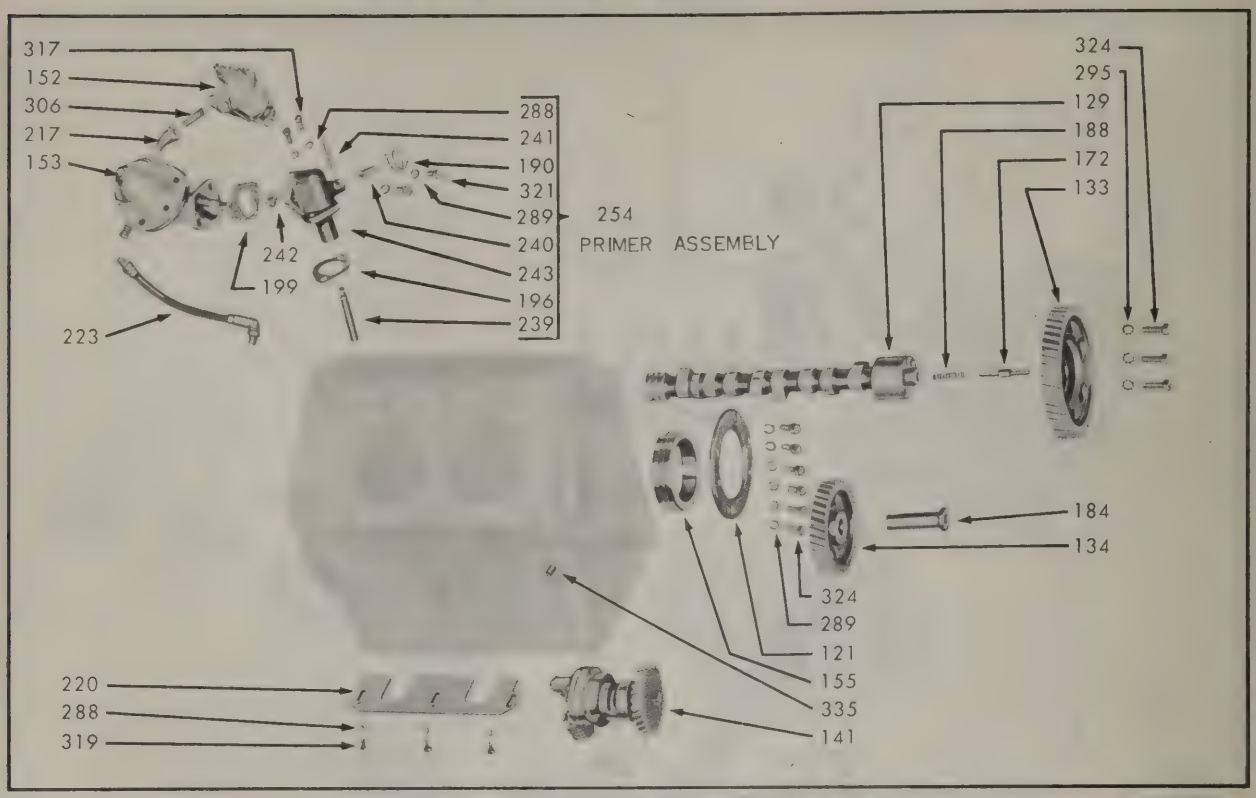
Parts are identified by reference number. See parts list for correct part number.



129793C

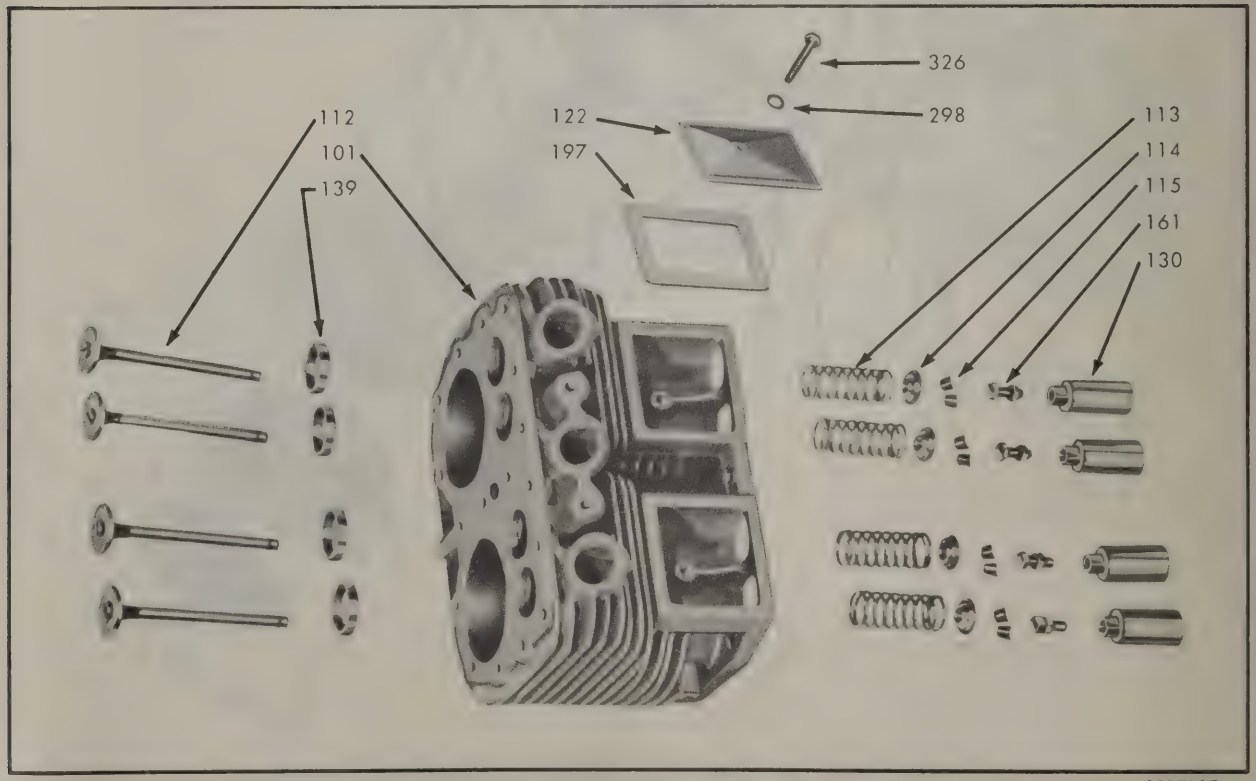
CRANKSHAFT, PISTON AND CONNECTING ROD GROUP

Parts are identified by reference number. See parts list for correct part number.



CAMSHAFT AND FUEL PUMP MOUNTING GROUP

129787C



CYLINDER BLOCK ASSEMBLY

129782C

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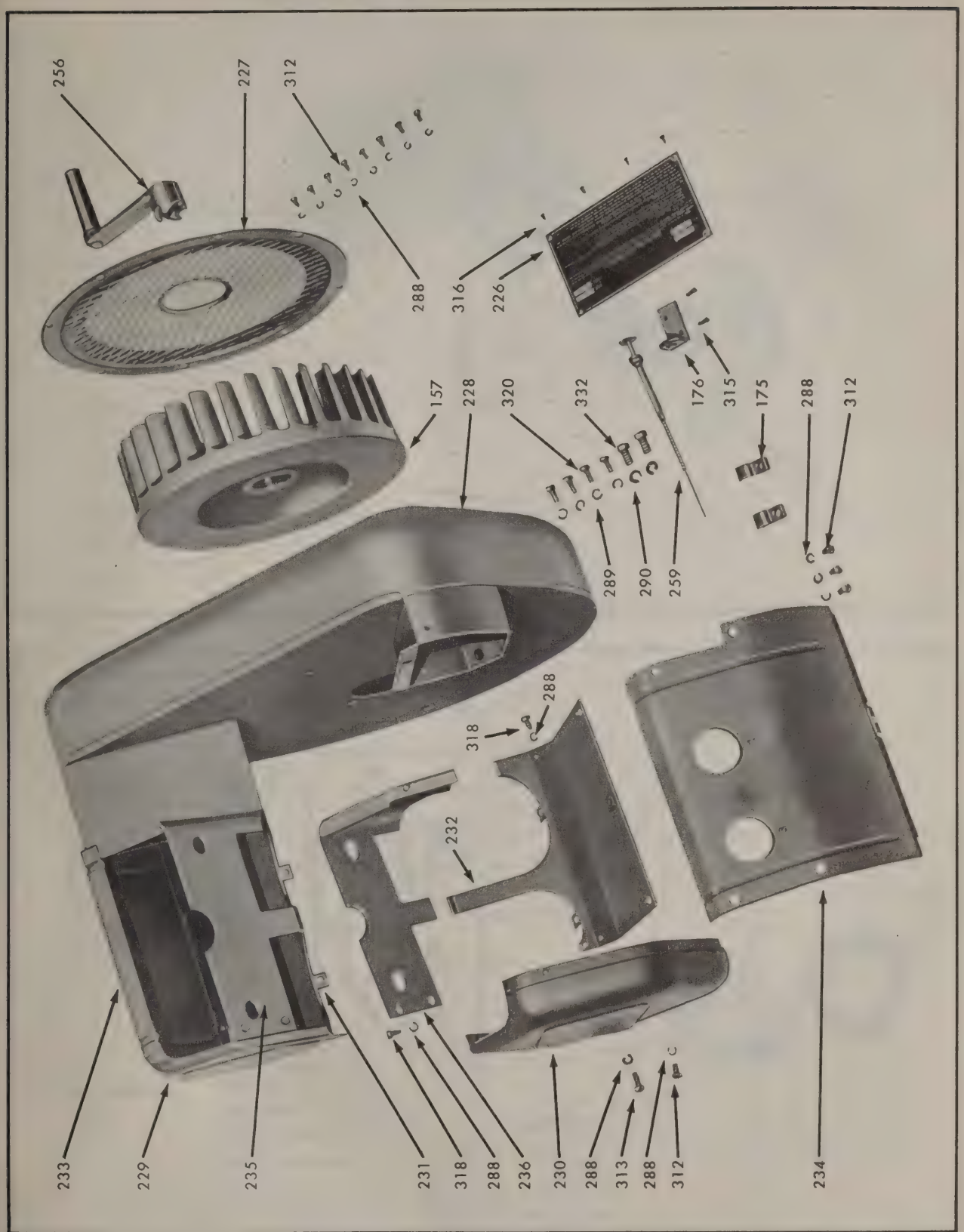
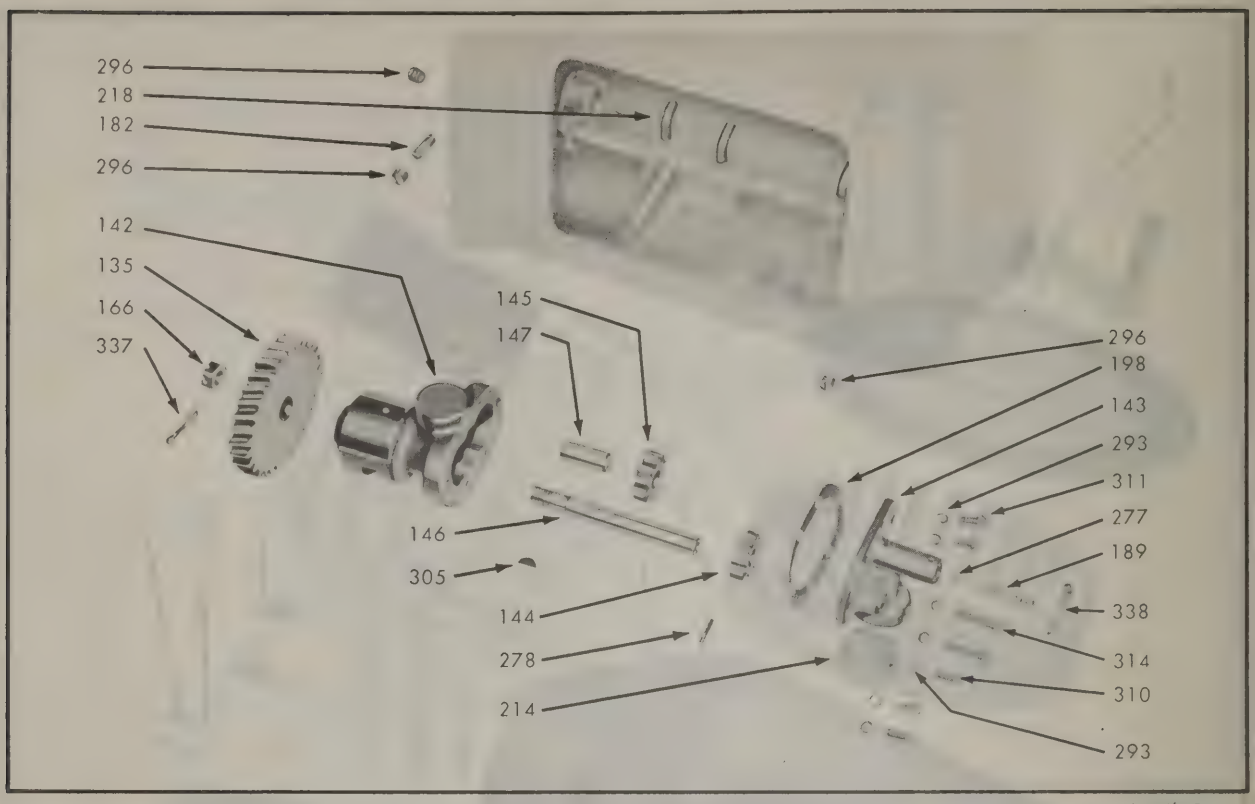


129788C

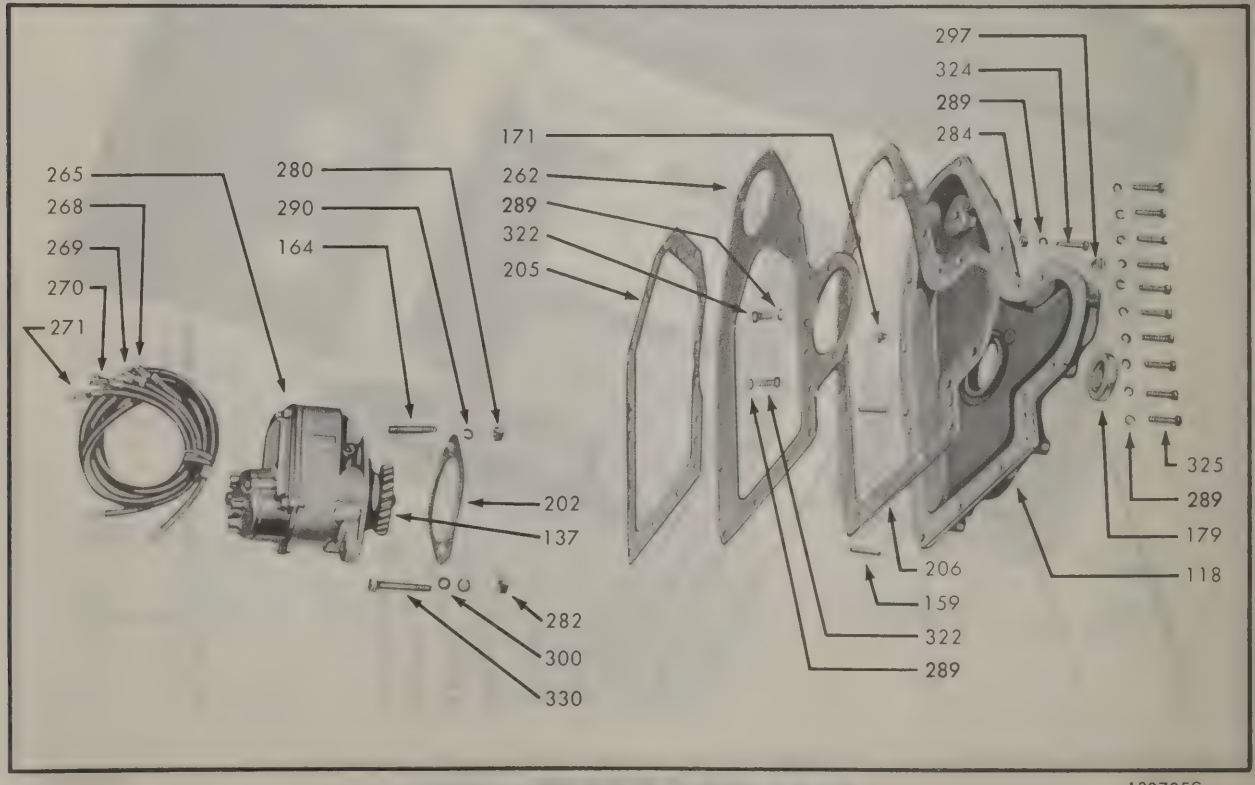
AIR SHROUDING

Parts are identified by reference number. See parts list for correct part number.



OIL PUMP ASSEMBLY

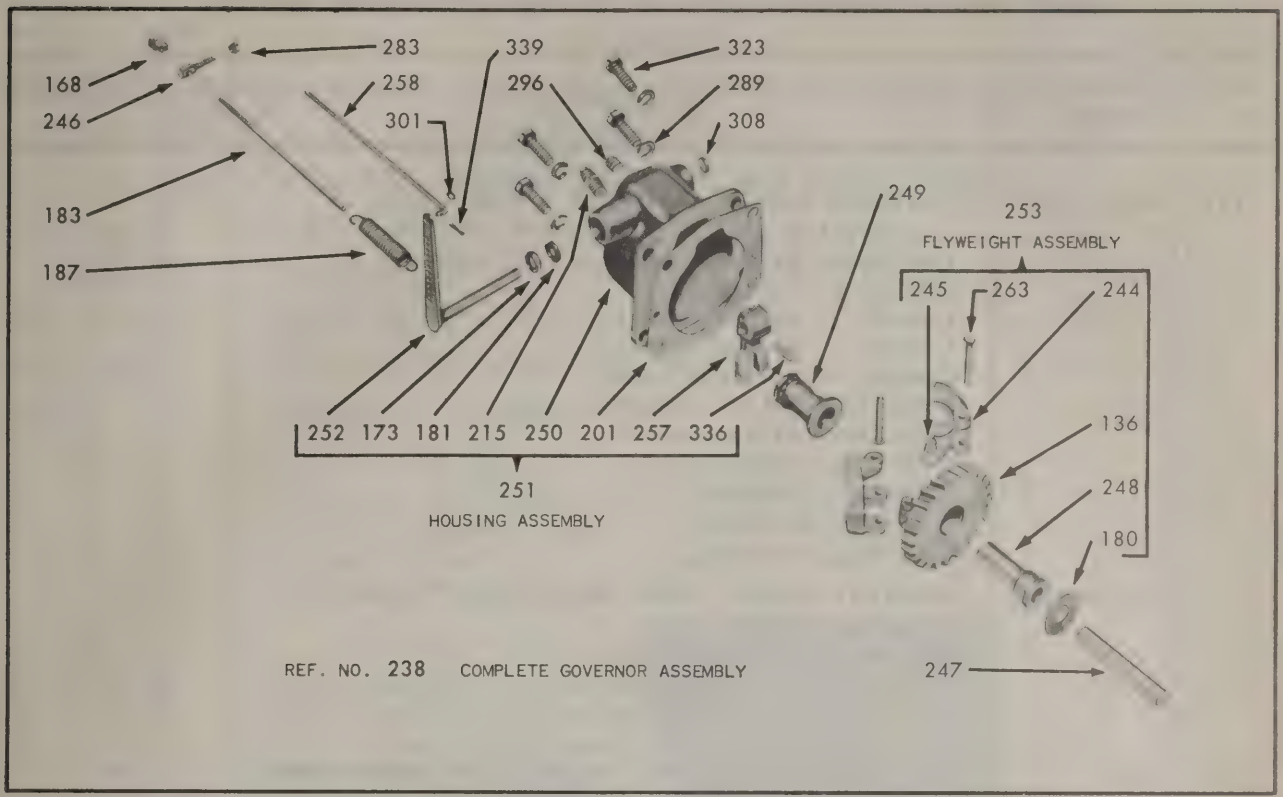
129786C



MAGNETO AND GEAR COVER GROUP

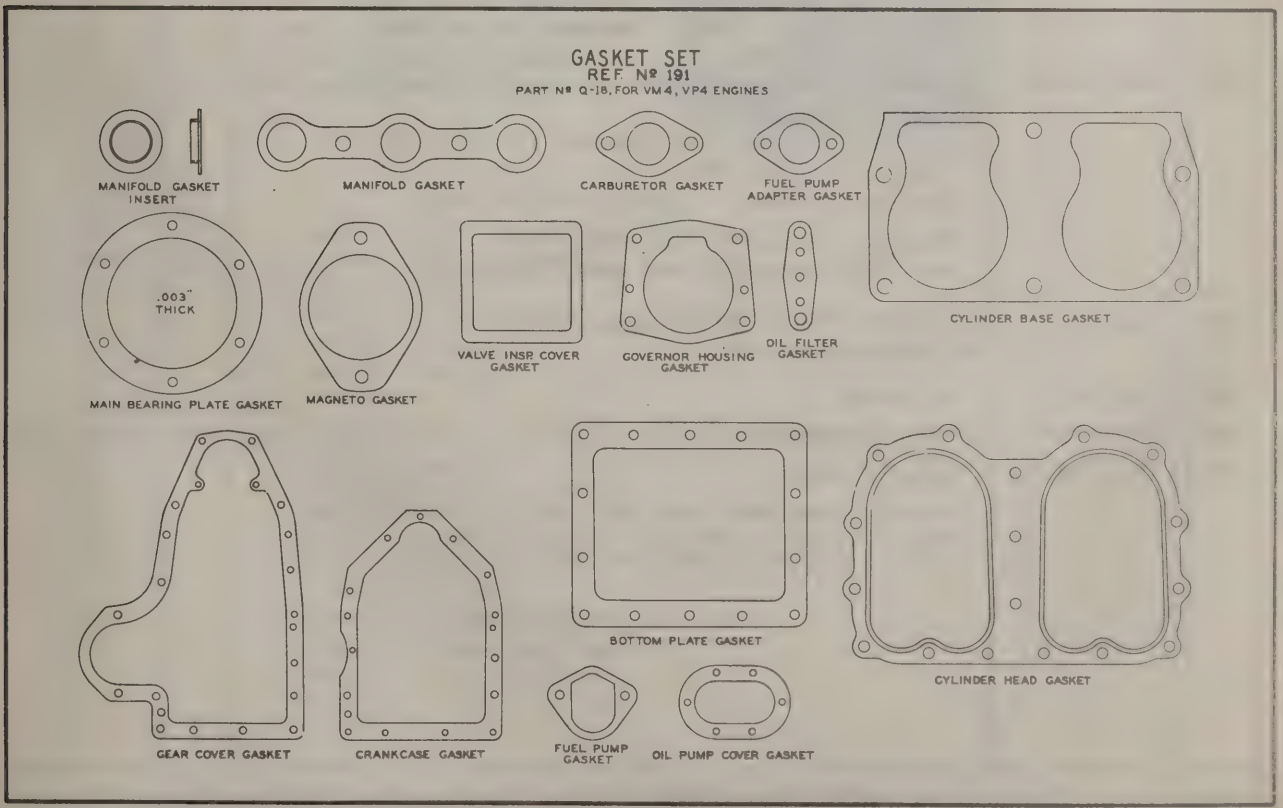
129785C

Parts are identified by reference number. See parts list for correct part number.



GOVERNOR ASSEMBLY

129792C



GASKET SET

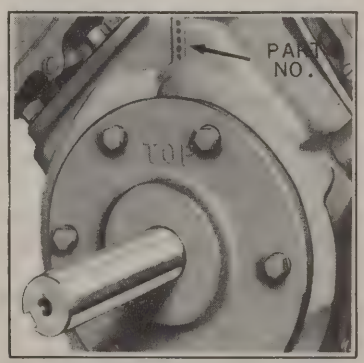
Parts are identified by reference number. See parts list for correct part number.

PARTS LIST

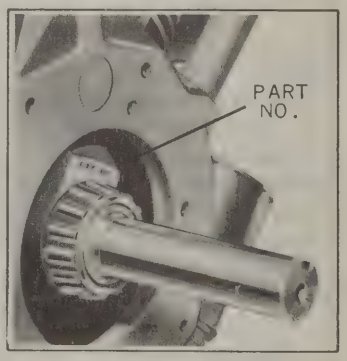
MODEL VP4 - 3-1/2" x 4" - 4 CYLINDER STANDARD ENGINE

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
101	AA-90A-S1	CYLINDER BLOCK ASSEMBLY - COMPLETE Consisting of: 1 AA-90-A Cylinder block 4 AE-76-E Valves 4 AF-50 Valve springs 4 AG-26 Spring seats 4 AH-9 Retainer locks 2 BH-103 Valve inspection cover 4 HG-150-A Valve inserts 2 PC-251 Studs 2 PH-14 Washers 2 QD-482 Gaskets 2 XD-23 Screws	2	44	
	AA-90A-S2	CYLINDER BLOCK WITH VALVE SEAT INSERTS Consisting of: 1 AA-90-A Cylinder block 4 HG-150-A Valve inserts 2 PC-251 Studs		41	
102	AB-91-D	CYLINDER HEAD for eng. beginning with Serial #1500001 AB-91-B Cylinder head, for engines to and including Serial #1,500,000 AB-91 Cylinder head - replaced by AB-91-B	2	14	
103	DB-183-D	PISTON, standard size, for engines beginning with Serial #1,500,001 DB-183-C Piston, for engines to and including Serial #1,500,000 DB-183-A Piston - replaced by DB-183-C Pistons are also furnished .005", .010", .020" and .030" oversize and semi-finished.	4	1	2
104	DR-15	PISTON RING SET, standard size. Consisting of:	1		10
105	DC-111	Oil ring	4		1
106	DC-126-A	Compression ring	8		1
107	DC-126A-1	Scraper ring Piston rings and ring sets are also furnished .005", .010", .020" and .030" oversize.	4		1

Order parts from nearest SERVICE STATION shown in directory following parts list.
IMPORTANT:Always give Model, Specification and Serial Numbers as shown on name plate.

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
112	AE-76-E	INLET AND EXHAUST VALVE, standard	8		4
	AE-76-D	STELLITE EXHAUST VALVE for VM4D & VP4D engines.	4		4
113	AF-50	VALVE SPRING, standard	8		2
	AF-52	VALVE SPRING, for eng. with Stellite exhaust valves.	4		2
114	AG-26	VALVE SPRING SEAT	8		1
115	AH-9	VALVE SPRING RETAINER LOCK	8pr		1
116		CRANKCASE ASSEMBLY Consisting of: 1 Crankcase — 1 RC-91 Screen 1 LJ-300A Oil filler tube — 4 RF-1121 Spray nozzles 2 PC-112 Studs — 2 SA-26 Plugs 12 PC-435 Studs — 1 SA-58 Plug 8 PF-18 Plugs	1	68	
		NOTE: The part number of the crankcase is stamped on the case in the location shown in Fig. 1. ORDER BY THIS NUMBER and by giving the Model, Specification and Serial Number of the engine.			
		 Fig. 1 76638C			
118	BD-101-S1	GEAR COVER ASSEMBLY Consisting of: 1 BD-101 Gear cover — 1 PH-269 Oil seal 1 PF-25 Plug — 1 TC-388-1 Governor shaft 1 PF-52 Button	1	15	
120	BG-193-3-S1	MAIN BEARING PLATE ASSEMBLY take-off end. Consisting of: 1 BG-193-3 Bearing plate 1 PH-202 Oil seal	1	5	12
	BG-193-3-S2	MAIN BEARING PLATE ASSEMBLY take-off end. Consisting of: 1 BG-193-3 Bearing plate 1 ME-98-1 Main bearing cup 1 PH-202 Oil seal		6	12

Order parts from nearest SERVICE STATION shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ.
121	BG-223	BEARING RETAINER PLATE, flywheel end	1		10
122	BH-103	VALVE TAPPER INSPECTION COVER	4		4
123	BH-155-A	CRANKCASE BOTTOM COVER PLATE	1	2	
125	BK-72	ENGINE SUPPORT (cast iron)	2	5	10
126		CRANKSHAFT ASSEMBLY Consisting of: 1 Crankshaft — 1 PL-49 Key 1 GA-35A-1 Gear — 1 RK-173 Oil sling 2 ME-98 Bearings NOTE: Beginning with engine Serial #771501 the crankshaft crank pins are 1-7/8" in diameter and DA-62-S1 connecting rods are used. Up to and including engine #771500 the crankshaft crank pins were 1-3/4" in diameter and DA-54A-S1 connecting rods were used. The part number of the crankshaft will be found stamped on the cheek facing the take-off end of the shaft as illustrated in Fig. 2. ORDER BY THIS NUMBER and by giving the Model, Specification and Serial Number of the engine.  Fig. 2 71057C	1	40	
127	DA-62-S1	CONNECTING ROD ASSEMBLY (1-7/8" crank pin bearing dia.) for engines beginning with Serial #771501 Consisting of: 1 DA-62 Connecting rod (not furnished separately) 1 HG-131-A Bushing 2 PB-146-1 Bolts — 2 PD-182 Palnuts 2 PD-11 Nuts — 2 QA-115 Shims DA-54A-S1 CONNECTING ROD ASSEMBLY (1-3/4" crank pin bearing dia.) for engines to and including Serial #771500. Connecting rods are also furnished .010", .020" and .030" undersize.	4	1	11

Order parts from nearest **SERVICE STATION** shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

PARTS INTERCHANGEABLE ON MODELS VM4 AND VP4

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
		A price allowance is made on connecting rods in which bearings have been burned out, but which are otherwise complete and in condition to be rebabbitted.			
128	DE-59	PISTON PIN Piston pins are also furnished .005", .010", .020" and .030" oversize.	4		3
129	EA-104	CAMSHAFT	1	3	14
130	F-60	VALVE TAPPET with PB-169 Lockscrew F-58A-S1 and F-58 Tappets - replaced by F-60	8		4
131	GA-35A-1	CRANKSHAFT GEAR GA-37 Gear - replaced by GA-35A-1	1	1	
133	GB-46	CAMSHAFT GEAR	1	2	14
134	GC-28	IDLER GEAR	1	2	1
135	GD-94-C	OIL PUMP GEAR	1		11
136	GD-100-A	GOVERNOR GEAR	1		7
137	GD-103	MAGNETO GEAR	1		13
138	HG-131-A	PISTON PIN BUSHING	4		1
139	HG-150-A	VALVE SEAT INSERT, standard	8		1
	HG-150-D	STELLITE EXHAUST VALVE SEAT INSERT	4		1
141	K-95-D	OIL PUMP ASSEMBLY - Complete	1	3	13
142	KA-61A-1-S1	OIL PUMP BODY ASSEMBLY Consisting of: 1 KA-61A-1 Body — 1 KD-122 Stub shaft	1	2	
143	KB-42-S2	OIL PUMP COVER ASSEMBLY Consisting of: 1 KB-42 Cover — 1 RD-112 Screen 1 ME-60 Check ball — 1 XA-7 Screw 1 PE-14 Washer — 1 XI-16 Cotter pin 1 PM-111 Spring	1	1	

Order parts from nearest SERVICE STATION shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

PARTS INTERCHANGEABLE ON MODELS VM4 AND VP4

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ.
144	KC-56-1	OIL PUMP GEAR (driver) KC-54-1 Gear - replaced by KC-56-1	1		1
145	KC-56-2	OIL PUMP GEAR (driven) KC-55-1 Gear - replaced by KC-56-2	1		1
146	KD-121-S1	OIL PUMP DRIVE SHAFT ASSEMBLY Consisting of: 1 PA-64 Pin 1 KD-121 Shaft 1 KC-56-1 Gear	1		5
147	KD-122	OIL PUMP STUB SHAFT	1		2
148	L-54-J	CARBURETOR Marvel-Schebler Model VH-45, #10-3396 L-54, L-54-A, L-54-C, L-54-D Carburetors - replaced by L-54-J NOTE: See carburetor bulletins in back of manual for service replacement parts list.	1	1	6
149	LD-240 LD-240-1	INLET AND EXHAUST MANIFOLD for open engine MANIFOLD for engines inclosed with sheet metal house (power unit)	1	19	
150	LJ-300-A	OIL FILLER TUBE	1		6
151	LO-60-1	OIL FILLER AND BREATHER CAP	1		6
152	LP-19-B	FUEL STRAINER Tillotson #OW-444 NOTE: See illustration in back of manual for service parts list of fuel strainer.	1		6
153	LP-38	FUEL PUMP AC #1537421 NOTE: For all repairs contact AC Company, Flint, Michigan, or their nearest distributor.	1	1	11
154	ME-98	MAIN BEARING ASSEMBLY Consisting of:	2	2	11
155		1 ME-98-1 Cup, Timken #453A			15
156		1 ME-98-2 Cone, Timken #455S		1	12
157	NC-146	FLYWHEEL Standard	1	46	
		NC-146-1-S1 Flywheel for engines with electric starter Consisting of:		47	
		1 GH-43 Ring gear 3 XE-17 Set screws 1 NC-146-1 Flywheel			

Order parts from nearest SERVICE STATION shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

PARTS INTERCHANGEABLE ON MODELS VM4 AND VP4

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ.
158	PA-275	PIN for starting crank	1		1
159	PA-291	DOWEL PIN (gear cover to case)	2		1
160	PB-146-1-S1	CONNECTING ROD BOLT ASSEMBLY Consisting of: 1 PB-146-1 Bolt 1 PD-11 Nut 1 PD-182 Palnut	8		2
161	PB-169	VALVE TAPPET ADJ. SCREW for F-60 tappets PB-147 with PD-141 nut for obsolete F-58A-S1 tappet	8		1
162	PC-112	STUD for mounting oil filter	2		1
163	PC-251	STUD for mounting manifold to cylinder block	4		1
164	PC-429	STUD for mounting magneto (upper hole)	1		2
165	PC-435	STUD for mounting cylinder block to case	12		2
166	PD-100-1	NUT for mounting oil pump gear	1		1
167	PD-157	NUT for mounting flywheel	1		2
168	PD-173-A	NUT for governor spring adjusting screw	1		1
169	PD-182	PALNUT for connecting rod bolts, 3/8"-24	8		1
170	PE-65-1	STAR LOCKWASHER for mounting flywheel	1		1
171	PF-52	CAMSHAFT THRUST PLUNGER BUTTON	1		1
172	PF-101	CAMSHAFT THRUST PLUNGER	1		1
173	PF-118	OIL SEAL RETAINER for governor cross shaft	1		1
175	PG-314	CLIP for spark plug cable	2		1
176	PG-475	BRACKET for choke control	1		1
177	PH-202	MAIN BEARING OIL SEAL take-off end	1		3
178	PH-245	CORK WASHER for oil sabre	1		1
179	PH-269	MAIN BEARING OIL SEAL flywheel end	1		2
180	PH-313-A	WASHER for governor gear bushing	1		1

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PARTS INTERCHANGEABLE ON MODELS VM4 AND VP4

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS.	NET WEIGHT OZ
181	PH-318-A	CORK OIL SEAL for governor cross shaft	1		1
182	PI-143-B	OIL PUMP LOCKSCREW PI-143-A Lockscrew - replaced by PI-143-B	1		1
183	PI-145	SCREW for adjusting governor spring	1		3
184	PJ-105	STUD for idler gear	1		5
185	PK-37	PISTON PIN RETAINING RING	8		1
187	PM-76	GOVERNOR SPRING	1		1
188	PM-108	CAMSHAFT THRUST PLUNGER SPRING	1		1
189	PM-111	RELIEF VALVE SPRING for oil pump	1		1
190	PM-145	SPRING for fuel pump primer handle	1		1
191	Q-18	GASKET SET Consisting of: 6 QB-83 — 1 QD-538-A — 2 QD-632 1 QC-12-A — 1 QD-595-A — 1 QD-633 2 QC-62 — 1 QD-615-A — 1 QD-634 1 QD-67 — 1 QD-616 — 1 QD-635 4 QD-482 — 2 QD-631 — 2 QD-636 1 QD-535	1		8
192	QA-115	CONNECTING ROD SHIM	8		1
193	QB-83	INSERT for manifold gasket	6		1
194	QC-12-A	GASKET for carburetor	1		1
195	QC-62	GASKET for manifold to cylinder block	2		1
196	QD-67	GASKET for fuel pump adapter	1		1
197	QD-482	GASKET for valve inspection cover	4		1
198	QD-535	GASKET for oil pump cover	1		1
199	QD-538-A	GASKET for mounting fuel pump	1		1
200	QD-595-A	GASKET for mounting oil filter	1		1

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PARTS INTERCHANGEABLE ON MODELS VM4 AND VP4

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ.
201	QD-615-A	GASKET for governor housing	1		1
202	QD-616	GASKET for mounting magneto	1		1
203	QD-631	GASKET for cylinder head	2		1
204	QD-632	GASKET for cylinder base	2		1
205	QD-633	GASKET for crankcase to spacer	1		1
206	QD-634	GASKET for gear cover	1		
207	QD-635	GASKET for bottom cover plate	1		1
208	QD-636	GASKET for bearing plate-take-off end (.003" thick)	2		1
210	QF-67	SHIM for bearing plate-take-off end (.006" thick)	2		1
211	QF-67-A	SHIM for bearing plate-take-off end (.014" thick)	2		1
212	RC-91	OIL FILLER SCREEN	1		1
214	RD-112	OIL PUMP SCREEN	1		1
215	RF-269-2	FITTING in governor housing for oil line	1		1
216	RF-270	ELBOW in crankcase for oil line to governor	1		1
217	RF-1096	STREET ELBOW 45° - in fuel pump inlet XK-38 1/8"x 90° street elbow for engines with fuel strainer.	1		1
218	RF-1121	OIL SPRAY NOZZLE	4		1
219	RJ-143	OIL SABRE with PH-245 cork	1		2
220	RK-171	CRANKCASE SPLASH PLATE	2		4
221	RK-173	CRANKSHAFT OIL SLINGER	1		2
222	RM-536	OIL LINE tubing with nuts-crankcase to governor	1		4
223	RM-1201-A	FUEL LINE pump to carburetor	1		4
224	RV-27-A	OIL FILTER Michiana #18200 NOTE: See illustration in back of parts list for service replacement parts of oil filter.	1	1	13

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PARTS INTERCHANGEABLE ON MODELS VM4 AND VP4

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
226	SD-115-N	ENGINE INSTRUCTION AND NAME PLATE NOTE: When ordering name plate, give Model, Specification Number and Serial Number for correct stamping.	1		1
227	SE-48	SCREEN for flywheel shroud	1	1	1
228	SE-124	FLYWHEEL SHROUD for std. engine and power unit	1	15	
		SE-124-A (with pad for mounting electric starter)		15	6
		SE-124-B (with pad for mounting air cleaner)		15	12
		SE-124-C (with pads for starter and air cleaner mt'g)		16	2
		SE-124-D (with pads for air cleaner and air stack ")		15	13
		SE-124-F (with pads for starter, air cleaner and air stack)		16	3
229	SE-125	REAR SHROUD COVER R.H. side	1	1	3
230	SE-125-A	REAR SHROUD COVER L.H. side	1	1	3
231	SE-126	LOWER CYLINDER SHROUD R.H. side	1		14
232	SE-126-A	LOWER CYLINDER SHROUD L.H. side	1		14
233	SE-127	CYLINDER HEAD SHROUD R.H. side	1	1	2
234	SE-127-A	CYLINDER HEAD SHROUD L.H. side	1	1	2
235	SE-128-B	CYLINDER HEAT DEFLECTOR R.H. side	1	1	
236	SE-128-C	CYLINDER HEAT DEFLECTOR L.H. side	1	1	
238	T-89-7-S1	GOVERNOR ASSEMBLY Consisting of: 1 TC-391 Thrust sleeve and bearing 1 TC-395-S1 Housing assembly 1 TC-405 Flyweight assembly	1	3	3
239	TA-111-1	FUEL PUMP PLUNGER (TA-116 must also be ordered)	1		1
240	TA-114	FUEL PUMP PRIMER SHAFT	1		1
241	TA-115	FUEL PUMP PRIMER HANDLE	1		1
242	TA-116	FUEL PUMP PLUNGER CAP	1		1
243	TB-105-B	FUEL PUMP ADAPTER Order TF-96, complete adapter and primer assembly.	1		

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PARTS INTERCHANGEABLE ON MODELS VM4 AND VP4

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
244	TC-322-A	GOVERNOR FLYWEIGHT	2		3
245	TC-328	GOVERNOR FLYWEIGHT THRUST PIN	2		1
246	TC-367-A	GOVERNOR ADJUSTING SCREW PIN	1		1
247	TC-388-1	GOVERNOR SHAFT	1		3
248	TC-389-1	GOVERNOR GEAR BUSHING	1		2
249	TC-391	GOVERNOR THRUST SLEEVE AND BEARING	1		2
250	TC-395	GOVERNOR HOUSING, Order TC-395-S1 Housing ass'y.	1		
251	TC-395-S1	GOVERNOR HOUSING ASSEMBLY Consisting of: 1 PF-18 Plug 1 PF-118 Retainer 1 PH-318-A Seal 1 QD-615-A Gasket 1 RF-269-2 Fitting 1 SA-52 Plug 1 TC-395 Housing 1 TC-398 Shaft and Lever 1 VB-151 Yoke 1 XH-1 Pin	1	2	
252	TC-398	GOVERNOR CROSS SHAFT AND LEVER	1		2
253	TC-405	GOVERNOR FLYWEIGHT ASSEMBLY Consisting of: 1 GD-100-A Gear 1 PH-313-A Washer 2 TC-322-A Flyweights 2 TC-328 Pins 1 TC-389-1 Bushing 2 XJ-47 Rivets	1	1	
254	TF-96	FUEL PUMP ADAPTER AND PRIMER ASSEMBLY Consisting of: 1 PM-145 Spring 1 TA-111-1 Plunger 1 TA-114 Shaft 1 TA-115 Handle 1 TA-116 Cap 1 TB-105-B Adapter	1	1	
256	U-226	STARTING CRANK	1	2	
257	VB-151	GOVERNOR YOKE	1		3
258	VE-549	GOVERNOR CONTROL ROD TO CARBURETOR	1		1
259	VE-575-D	CHOKE CONTROL VE-435-4 Control - replaced by VE-575-D	1		4
261	WD-47	STANDARD MUFFLER (for 1-1/2" pipe tap)	1	3	

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REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
262	WE-243	GEAR COVER SPACER	1	2	4
263	XJ-47	RIVET for governor flyweight. Replaces PA-265 pin and 2 XI-33 cotter pins (Interchangeable)	2		1
265	Y-74-1-S1	MAGNETO "Fairbanks-Morse" #FM-XV4B7A With gear Y-41-1-S1 Magneto - replaced by Y-74-1-S1	1	7	8
	Y-54-S2	MAGNETO "Wico" #XH-1343 With gear		6	
		NOTE: These engines are equipped with either a "Fairbanks-Morse" or "Wico" magneto as shown above. See magneto bulletins in back of manual for service replacement parts list.			
266	YD-6	SPARK PLUG - Champion 18mm, #8 Com. (or equivalent)	4		2
267	YD-12	RUBBER SPARK PLUG NIPPLE	4		1
268	YL-81	MAGNETO IGNITION CABLE to #1 cylinder-30-5/8" long	1		2
269	YL-82	MAGNETO IGNITION CABLE to #2 cylinder-37-5/8" long	1		2
270	YL-80	MAGNETO IGNITION CABLE to #3 cylinder-34-5/8" long	1		2
271	YL-142	MAGNETO IGNITION CABLE to #4 cylinder-40-5/8" long	1		2
		STANDARD HARDWARE			
		NOTE: The following pipe nipples, pins, nuts, washers, capscrews and etc. are of a common hardware variety and can be purchased from local plumbing or hardware stores.			
276	LJ-161	PIPE NIPPLE, 1-1/2" x 2" long For mounting muffler.	1		6
277	ME-60	STEEL BALL, 1/4" dia. For oil pump relief valve.	1		1
278	PA-64	PIN, 1/8" dia. x 3/4" straight, steel For oil pump gear.	1		1

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PARTS INTERCHANGEABLE ON MODELS VM4 AND VP4

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS.	NET WEIGHT OZ.
279	PD-10	NUT, 5/16"-24 thread, hexagon steel For mounting oil filter.	2		1
280	PD-11	NUT, 3/8"-24 thread, hexagon steel 1-for magneto stud (upper hole) 8-for connecting rod bolts	9		1
281	PD-13	NUT, 1/2"-20 thread, hexagon steel For mounting cylinder block to crankcase.	12		1
282	PD-76	NUT, 3/8"-16 thread, hexagon steel For magneto screw (lower hole).	1		1
283	PD-77	NUT, 1/4"-20 thread, hexagon steel For governor adjusting screw pin.	1		1
284	PD-78	NUT, 5/16"-18 thread, hexagon steel For spacer to gear cover (L.H.side).	1		1
285	PD-104	NUT, 7/16"-20 thread, hexagon brass For manifold to cylinder block.	4		1
288	PE-3	LOCKWASHER, 1/4" Positive 2-for fuel pump adapter. 6-for crankcase splash plates. 8-for flywheel shroud screen. 32-for air shrouding.	48		1
289	PE-4	LOCKWASHER, 5/16" Positive 14-for bottom cover. 4-for flywheel shroud to gear cover. 19-for gear cover and spacer to case. 2-for mounting fuel pump. 2-for mounting carburetor. 2-for mounting oil filter. 6-for bearing plate (flywheel end). 4-for mounting governor housing.	53		1
290	PE-5	LOCKWASHER, 3/8" Positive 6-for bearing plate (take-off end). 2-for magneto mounting. 2-for flywheel shroud to gear cover(center holes).	10		1
291	PE-6	LOCKWASHER, 7/16" Positive For mounting manifold to cylinder blocks.	4		1
292	PE-7	LOCKWASHER, 1/2" Positive For cylinder block to crankcase studs.	12		1

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PARTS INTERCHANGEABLE ON MODELS VM4 AND VP4

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS.	NET WEIGHT OZ.
293	PE-14	LOCKWASHER, #10 Positive 6-for oil pump cover. 1-for oil pump screen.	7		1
294	PE-37	LOCKWASHER, 5/8" Positive For engine supports to crankcase.	4		1
295	PE-46	LOCKWASHER, 5/16" External Everlock For mounting camshaft gear.	3		1
296	PF-18	PIPE PLUG, 1/8" slotted, steel 5-for taps in oil header tube. 1-for oil filter inlet hole (bottom of case). 1-for oil pump lockscrew. 1-for oil header. 1-in governor housing.	9		1
297	PF-25	PIPE PLUG, 3/8" slotted, steel For timing hole in gear cover.	1		2
298	PH-14	WASHER, 5/16" I.D. x 19/32" O.D., plain copper For valve inspection cover.	4		1
299	PH-22	WASHER, 3/8" I.D. x 11/16" O.D., plain steel For mounting cylinder heads.	34		1
300	PH-22-A	WASHER, 3/8" I.D. x 11/16" O.D. x 3/32" thick, plain steel. For magneto mounting screw.	1		1
301	PH-332	WASHER, 1/8" I.D. x 5/16" O.D. x 1/32" thick, plain steel. Between governor control rod and lever.	1		1
303	PL-24	WOODRUFF KEY, No. 29 For mounting flywheel.	1		1
304	PL-49	WOODRUFF KEY, No. 15 For crankshaft gear.	1		1
305	PL-137	WOODRUFF KEY, No. 1 For oil pump gear.	1		1
306	RF-794	PIPE NIPPLE, 1/8" x 3/4" long For mounting fuel strainer.	1		1
307	SA-26	PLUG, 5/8" Expansion For camshaft oil hole.	2		1

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PARTS INTERCHANGEABLE ON MODELS VM4 AND VP4

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
308	SA-52	PLUG, 1/2" Expansion For governor cross shaft (in housing).	1		1
309	SA-58	PLUG, 1-3/8" Expansion For camshaft end hole.	1		1
310	XA-7	SCREW, #10-32 thread x 3/8"long, steel round head For mounting oil pump screen.	1		1
311	XA-8	SCREW, #10-32 thread x 1/2"long, steel round head For mounting oil pump cover.	4		1
312	XA-33	SCREW, 1/4"-20 thread x 3/8"long, steel round head 8-for flywheel shroud screen. 16-for shroud covers and lower cylinder covers. 4-for lower covers to cylinder block. 2-for rear covers-lower holes to cylinder block.	30		1
313	XA-34	SCREW, 1/4"-20 thread x 1/2"long, steel round head For rear shroud covers - upper holes.	2		1
314	XA-56	SCREW, #10-32 x 1-1/4" long, steel round head For mounting oil pump cover.	2		1
315	XA-65	SCREW, #8 x 1/2" long, self tapping, sheet metal For mounting choke control bracket.	2		1
316	XA-67	SCREW, #4 x 1/4" long, self tapping, sheet metal For mounting name and instruction plate.	4		1
317	XB-75	SCREW, 1/4"-20 thread x 3/4" long, Allen head cap- For mounting fuel pump adapter. screw	2		1
318	XD-3	SCREW, 1/4"-20 thread x 3/8" long, hexagon head 2-for shroud to cylinder blocks. 4-for heat deflector to rear covers. 2-for lower cylinder covers to shroud. 1-for tap in cylinder block (R.H. side).	9		1
319	XD-4	SCREW, 1/4"-20 thread x 1/2" long, hexagon head For mounting crankcase splash plates.	6		1
320	XD-13-1	SCREW, 5/16"-18 thread x 1/2"long(1/8" thick hex. For mounting flywheel shroud to gear cover. head)	4		1
321	XD-14	SCREW, 5/16"-18 thread x 5/8"long, hexagon head 14-for crankcase bottom cover. 2-for mounting fuel pump.	16		1
322	XD-15	SCREW, 5/16"-18 thread x 3/4"long, hexagon head For mounting spacer to gear cover and crankcase.	8		1

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MP-164

PARTS INTERCHANGEABLE ON MODELS VM4 AND VP4

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS.	NET WEIGHT OZ.
323	XD-16	SCREW, 5/16"-18 thread x 7/8"long, hexagon head For mounting governor housing.	4		1
324	XD-17	SCREW, 5/16"-18 thread x 1" long, hexagon head 6-for bearing retainer plate (flywheel end). 3-for mounting camshaft gear. 1-for spacer to gear cover.	10		2
325	XD-19	SCREW, 5/16"-18 thread x 1-1/4"long, hexagon head 10-for mounting gear cover. 2-for mounting carburetor.	12		2
326	XD-23	SCREW, 5/16"-18 thread x 2" long, hexagon head For valve inspection cover.	4		2
328	XD-29	SCREW, 3/8"-16 thread x 1-1/4" long, hexagon head For main bearing plate (take-off end).	6		2
329	XD-30	SCREW, 3/8"-16 thread x 1-1/2" long, hexagon head For mounting cylinder heads.	34		2
330	XD-33	SCREW, 3/8"-16 thread x 2-1/4" long, hexagon head For mounting magneto.	1		2
331	XD-52	SCREW, 5/8"-11 thread x 1-3/4" long, hexagon head For engine supports to crankcase.	4		2
332	XD-114	SCREW, 3/8"-16 thread x 5/8" long, hexagon head For mounting flywheel shroud to gear cover.	2		1
334	XE-64	SCREW, 1/4"-20 thread x 3/8" long, Allen head set For starting crank pin.	1		1
335	XE-55	SCREW, 5/16"-18 thread x 3/8"long, Allen head set For mounting idler stud.	1		1
336	XH-1	TAPER PIN, #0 x 3/4" long For governor yoke.	1		1
337	XI-9	COTTER PIN, 3/32" x 1" long For oil pump drive gear nut.	1		1
338	XI-16	COTTER PIN, 1/8" x 1" long For oil pump relief valve spring.	1		1
339	XI-32	COTTER PIN, 3/64"x3/8" long For governor control rod.	1		1
340	XK-4	PIPE PLUG, 1/2" square head For oil drain.	1		1

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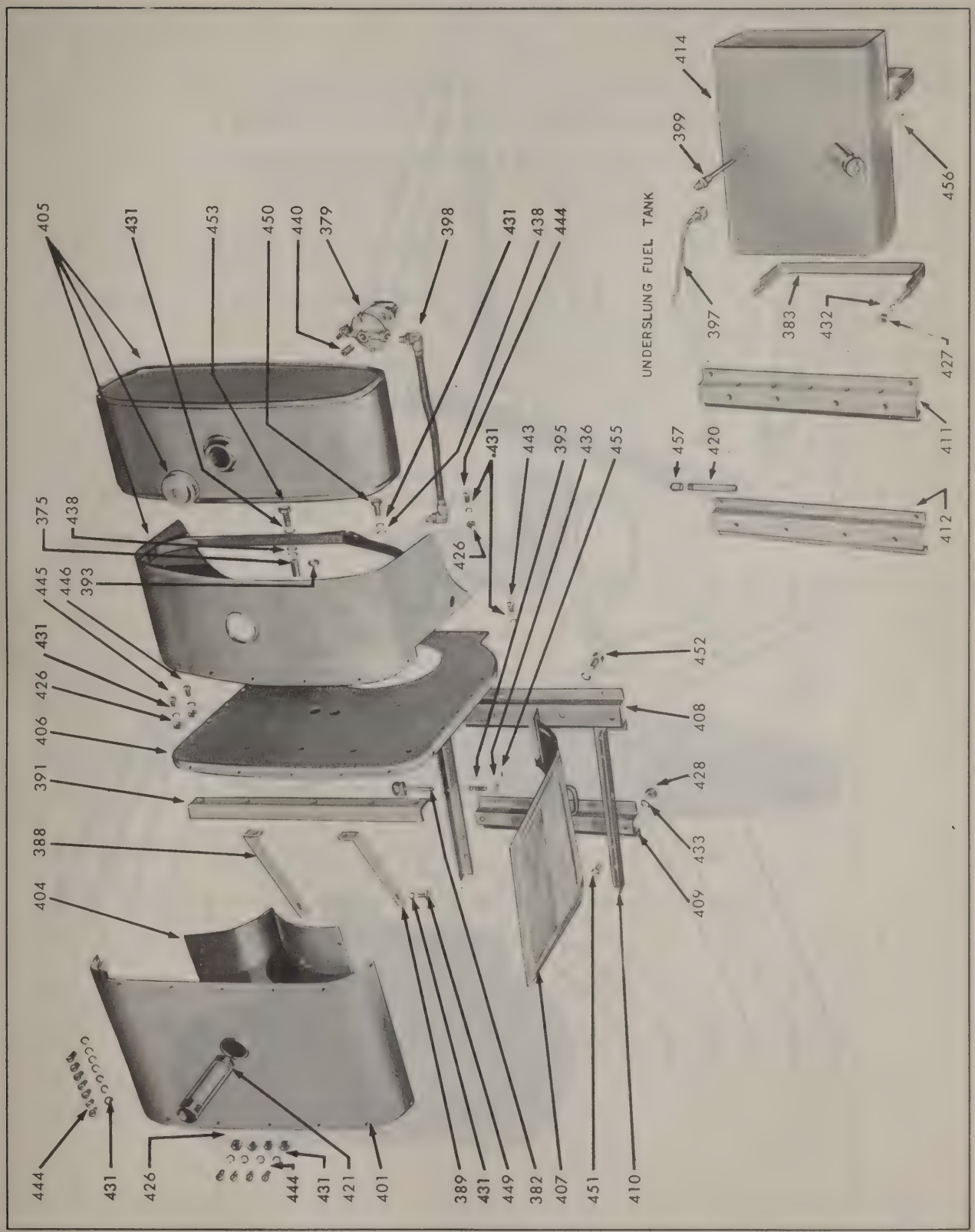
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

VM4 AND VP4 ENGINE HOUSE WITH FUEL TANK AT TAKE-OFF END OR UNDERSLUNG FUEL TANK

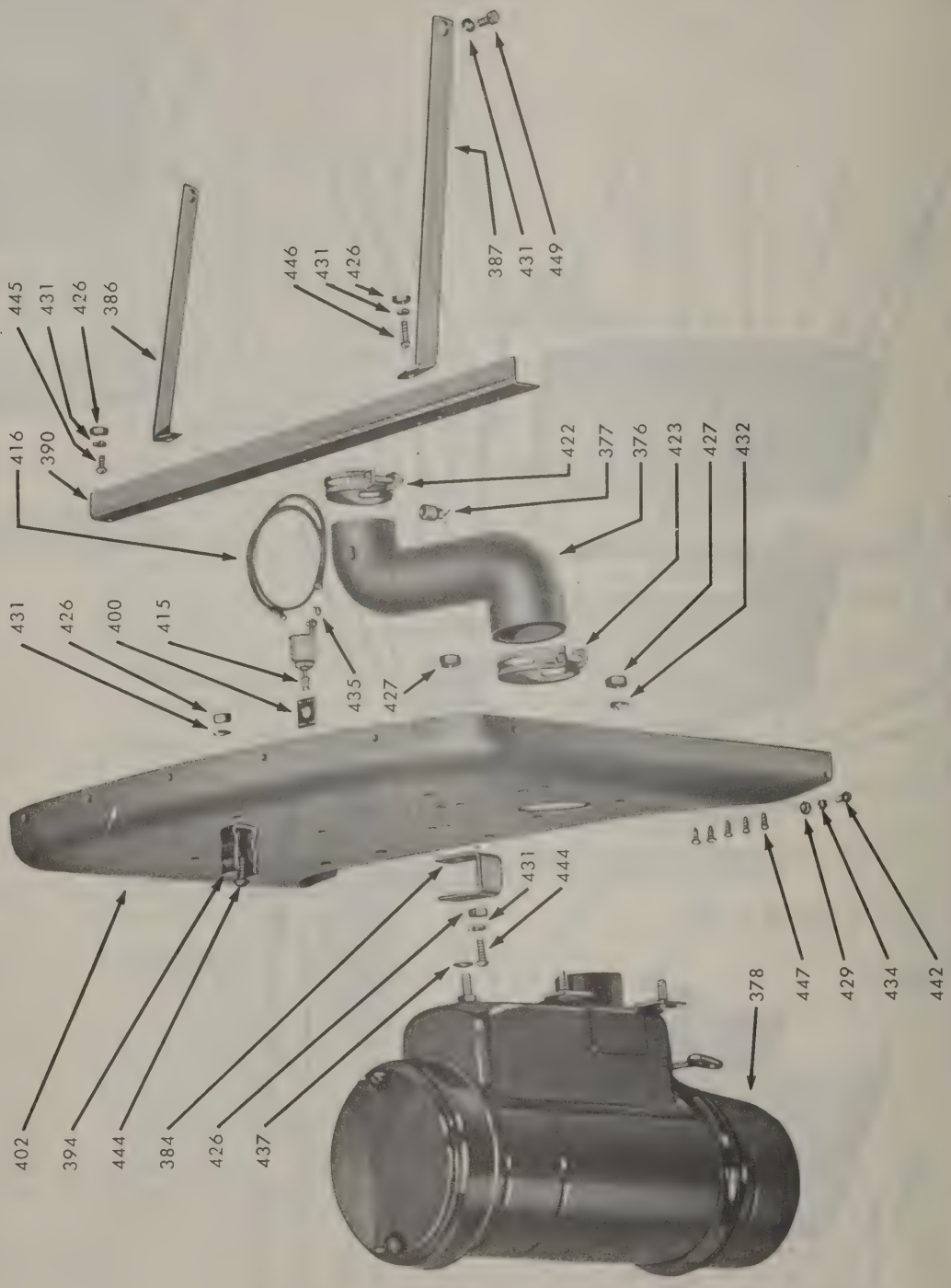


129783C

ENGINE HOUSE AND FUEL TANK GROUP

Parts are identified by reference number. See parts list for correct part number.

VM4 AND VP4 ENGINE HOUSE WITH FUEL TANK AT TAKE-OFF END OR UNDERSLUNG FUEL TANK



125976C

END PANEL AND AIR CLEANER FOR UNIT HOUSE

Parts are identified by reference number. See parts list for correct part number.

VM4 AND VP4 ENGINE HOUSE WITH FUEL TANK AT TAKE-OFF END OR UNDERSLUNG FUEL TANK

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
375	HF-397	SPACER between rear panel and cylinder block.	1		1
376	LL-88-S1	RUBBER ELBOW ASSEMBLY for air cleaner connection. Consisting of: 1 LL-88 Elbow 1 LO-88 Drip plug	1		12
377	LO-88	DRIP TUBE ASSEMBLY for carburetor.	1		1
378	LO-89	AIR CLEANER Donaldson #1234-A2 LO-77-A Donaldson #A-614 - replaced by LO-89, interchangeable.	1	7	8
379	LP-19	FUEL STRAINER Tillotson #OW-418 NOTE: See illustration in back of manual for service parts list of fuel strainer.	1		12
382	PG-323	DOOR CLIP	2		3
383	PG-454	TANK STRAP for underslung fuel tank.	2	1	4
384	PG-491	BRACKET for starting crank.	1		2
386	PG-521	BRACE to front panel - magneto side (for engines beginning with Serial #1089248) PG-463 Brace (to and including Serial #1089247)	1		5
387	PG-522	BRACE to front panel - R.H. side (for engines beginning with Serial #1089248) PG-462 Brace (to and including Serial #1089247)	1		6
388	PG-523	BRACE to rear panel - L.H. side (for engines beginning with Serial #1089248) PG-436 Brace (to and including Serial #1089247)	1		5
389	PG-524	BRACE to rear panel - R.H. side (for engines beginning with Serial #1089248) PG-435 Brace (to and including Serial #1089247)	1		3
390	PG-525	ANGLE for reinforcing front panel.	1	1	6
391	PG-526	ANGLE for reinforcing rear panel.	1	1	7
393	PH-198	GROMMET in rear panel for fuel line.	1		1
394	PK-87	CLIP for crank mounting.	1		1
395	PM-137	SPRING for door clip.	2		1

Order parts from nearest SERVICE STATION shown in directory following parts list.
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VM4 AND VP4 ENGINE HOUSE WITH FUEL TANK AT TAKE-OFF END OR UNDERSLUNG FUEL TANK

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS.	NET WEIGHT OZ
397	RM-450	**FUEL LINE** tubing with nuts, 20-3/4" long. underslung fuel tank to pump.	1		6
398	RM-1202-A	**FLEX-O-TUBE FUEL LINE** 16-1/4" long, tank to carburetor.	1		5
399	RM-1209	**SUCTION TUBE ASSEMBLY** for underslung fuel tank RM-1206-C Suction Tube - replaced by RM-1209.	1		3
400	SD-108	TAG for ignition switch.	1		1
401	WE-247-A	CANOPY	1	6	
402	WE-248	**FRONT PANEL** (standard) WE-248-3 Panel (with additional holes for switch and ammeter) for units with electrical equipment.	1	6	4
404	WE-249-A	HEAT DEFLECTOR	1	1	4
405	WE-250	**FUEL TANK ASSEMBLY** take-off end. Consisting of: Supports and Straps (not furnished separately) RC-77 Gas tank cap. WE-250-1 Tank with cap.	1 1 1	23 10	 3
406	WE-251-A WE-251A-2	**REAR PANEL** for unit with tank at take-off end Rear Panel (with hole to clear fuel pump) For units with underslung fuel tank.	1	11	8
407	WE-252	DOOR WE-252-1 Door, L.H. side (bumped out to clear distributor) for units with electrical equipment.	2	6	
408	WE-253	**ENGINE SUPPORT** T.O. end - for units with fuel tank at take-off end.	1	4	5
409	WE-254	**ENGINE SUPPORT** flywheel end - for units with fuel tank at take-off end.	1	3	12
410	WE-255	SIDE RAIL	2	1	4
411	WE-275	**ENGINE SUPPORT** T.O. end - for units with underslung fuel tank.	1	5	8
412	WE-276	**ENGINE SUPPORT** flywheel end - for units with underslung fuel tank.	1	5	

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VM4 AND VP4 ENGINE HOUSE WITH FUEL TANK AT TAKE-OFF END OR UNDERSLUNG FUEL TANK

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS.	NET WEIGHT OZ
414	WE-277-S1	UNDERSLUNG FUEL TANK with RC-87 cap and RM-1206-C suction tube.	1	11	
415	YC-9-A	IGNITION SWITCH	1		2
416	YL-134	MAGNETO GROUND WIRE	1		2
		STANDARD HARDWARE			
420	LJ-295	PIPE NIPPLE 1/2" x 4" long For oil drain on units with underslung tank.	1		3
421	LJ-337	PIPE NIPPLE 1-1/2" x 9-1/4" long For mounting exhaust muffler.	1	2	
422	LK-8	HOSE CLAMP 2-1/8" I.D. For air cleaner connection, carburetor end.	1		1
423	LK-9	HOSE CLAMP 2-3/8" I.D. For air cleaner connection, cleaner end.	1		1
426	PD-77	NUT 1/4"-20 thread, hexagon steel 10-for braces to rear and front panels. 8-for fuel tank support to rear panel. 4-for heat deflector to canopy. 3-for mounting crank support and clip.	25		1
427	PD-78	NUT 5/16"-18 thread, hexagon steel 5-for mounting air cleaner. 4-for underslung tank to engine supports.	9		1
428	PD-79	NUT 3/8"-16 thread, hexagon steel For side rails to engine supports.	4		1
429	PD-115	NUT #10-32 thread, hexagon steel For front panel to side of flywheel shroud.	2		1
431	PE-3	LOCKWASHER 1/4" Positive 14-for canopy. 12-for mounting braces from manifold to panels. 8-for tank support to rear panel. 5-for mounting rear panel. 4-for heat deflector to canopy. 3-for mounting crank support and clip.	46		1

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VM4 AND VP4 ENGINE HOUSE WITH FUEL TANK AT TAKE-OFF END OR UNDERSLUNG FUEL TANK

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
432	PE-4	LOCKWASHER 5/16" Positive 5-for mounting air cleaner. 4-for mounting underslung tank to engine supports	9		1
433	PE-5	LOCKWASHER 3/8" Positive For side rails to engine supports.	4		1
434	PE-45	LOCKWASHER #10 External "Everlock" For front panel to side of flywheel shroud.	2		1
435	PE-72	LOCKWASHER ignition switch terminal.	1		1
436	PH-2	PLAIN WASHER 7/16" I.D. x 1/16" thick steel For door clip.	2		1
437	PH-77-A	PLAIN WASHER 5/16" I.D. x 1/16" thick steel For air cleaner support screw.	1		1
438	PH-196	PLAIN WASHER 1/4" I.D. x 1/16" thick steel For rear panel to cylinder block mounting.	3		1
440	RF-794	NIPPLE 1/8" x 3/4" long, close pipe For Fuel strainer mounting.	1		1
442	XA-8	SCREW #10-32 thread x 1/2" long, round head For front panel to side of flywheel shroud.	2		1
443	XA-33	SCREW 1/4"-20 thread x 3/8" long, round head For rear panel to engine support.	5		1
444	XA-34	SCREW 1/4"-20 thread x 1/2" long, round head 14-for mounting canopy. 8-for fuel tank support to rear panel. 4-for heat deflector to canopy. 3-for mounting crank support and clip.	29		1
445	XA-35	SCREW 1/4"-20 thread x 5/8" long, round head For mounting reinforcing angles.	6		1
446	XA-36	SCREW 1/4"-20 thread x 3/4" long, round head For mounting panel braces.	4		1
447	XA-65	SCREW #8 x 1/2"long, self tapping, sheet metal For front panel to flywheel shroud.	5		1

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VM4 AND VP4 ENGINE HOUSE WITH FUEL TANK AT TAKE-OFF END OR UNDERSLUNG FUEL TANK

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
449	XD-5	SCREW 1/4"-20 thread x 5/8" long, hexagon head For house braces to manifold.	2		1
450	XD-7	SCREW 1/4"-20 thread x 1" long, hexagon head For rear panel to cylinder block - R.H. side.	1		1
451	XD-25	SCREW 3/8"-16 thread x 3/4" long, hexagon head For side rails to engine supports.	4		1
452	XD-51	SCREW 5/8"-11 thread x 1-1/4" long, hexagon head For mounting engine supports to case.	4		2
453	XD-120	SCREW 1/4"-20 thread x 3-1/4" long, hexagon head For rear panel to cylinder block - L.H. side.	1		1
455	XI-23	COTTER PIN 1/8" x 3/4" long For door clips.	2		1
456	XK-1	PLUG 1/8" square head pipe For fuel tank drain.	1		1
457	XK-117	COUPLING 1/2" W.I. pipe For oil drain pipe.	1		1

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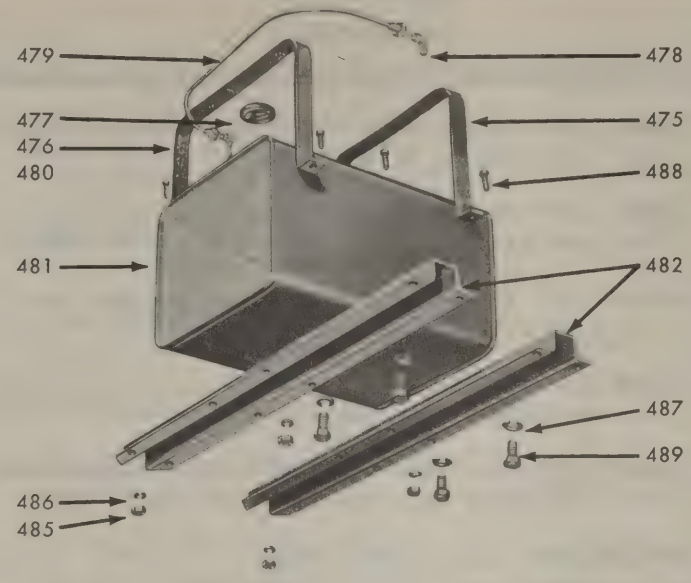
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

SIDE MOUNT FUEL TANK
FOR VM4 AND VP4 ENGINES



REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS.	NET WEIGHT OZ
475	PG-455	STRAP for fuel tank.	2	1	8
476	PH-244-A	FELT for fuel tank strap.	2		1
477	RC-77	CAP for fuel tank.	1		3
478	RF-270	ELBOW for fuel line, in pump.	1		1
479	RM-822	FUEL LINE from tank to pump (27-1/4" long).	1		4
		RM-524 for engines with electric starter (31-3/4" long)	1		5
480	RM-1206-A	SUCTION TUBE ASSEMBLY for fuel tank.	1		3
481	WE-278-S1	FUEL TANK 9 gal. capacity. With RC-77 cap and RM-1206-A suction tube.	1	11	
482	WE-279	ENGINE SUPPORT	2	7	
		WE-281 for engines with electric starter.		8	8
		STANDARD HARDWARE			
485	PD-79	NUT, 3/8"-16 thread, hexagon steel. For fuel tank straps to supports.	4		1
486	PE-5	LOCKWASHER, 3/8" Positive. For fuel tank straps to supports.	4		1
487	PE-37	LOCKWASHER, 5/8" Positive. For engine supports to crankcase.	4		1
488	XD-27	SCREW, 3/8"-16 thread x 1"long, hexagon head. For fuel tank straps to supports.	4		1
489	XD-51	SCREW, 5/8"-11 thread x 1-1/4"long, hexagon head. For engine supports to crankcase.	4		2

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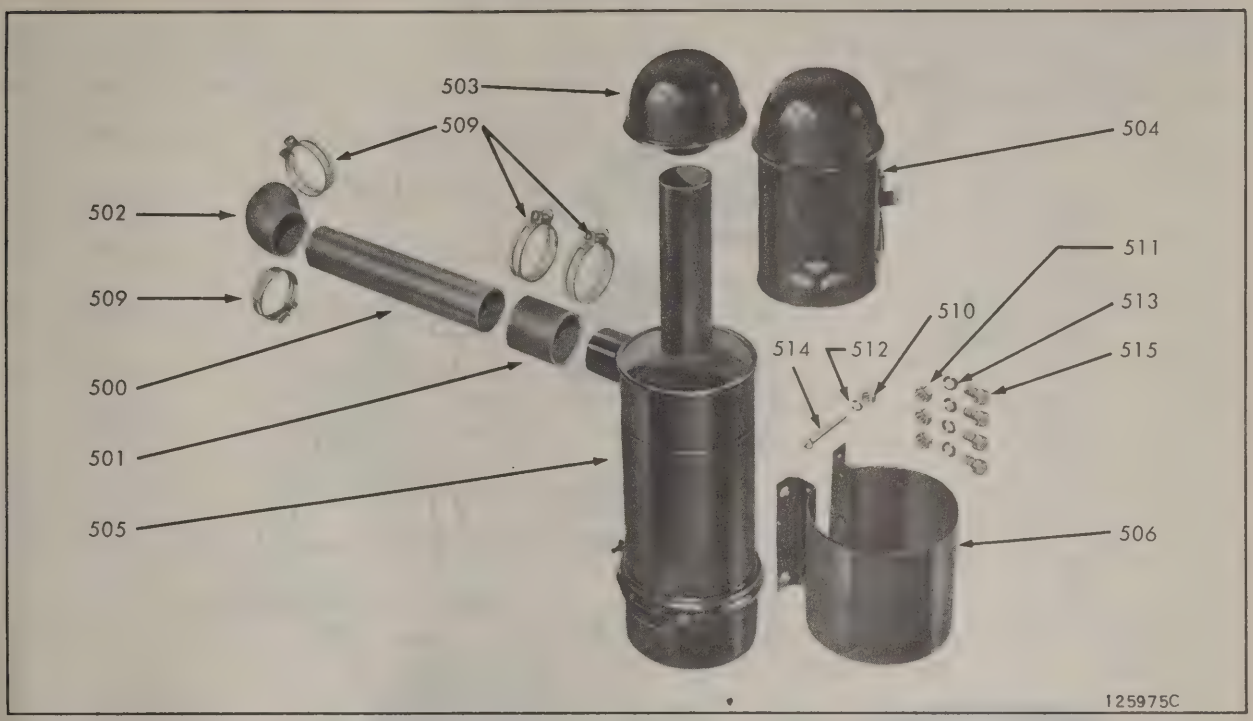
SIDE MOUNT AIR CLEANER
FOR VM4 AND VP4 ENGINES



REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
500	LJ-131	TUBE for air cleaner to carburetor elbow.	1	1	6
501	LL-18	RUBBER HOSE for air cleaner tube.	1		2
502	LL-89	RUBBER ELBOW for air cleaner tube.	1		6
503	LO-62	PRE-CLEANER, Donaldson Co. #2X-1674-1	1	1	
504	LO-82-A	PRE-CLEANER, Donaldson #EX-1492-6, agricultural engines		1	4
505	LO-90	AIR CLEANER, Donaldson Co. #1234A1 LO-78 Donaldson #A-613, replaced by LO-90 but PG-512 strap must also be ordered.	1	5	
506	PG-512	STRAP for mounting LO-90 air cleaner. PG-456 Strap for LO-78 air cleaner.	1	2	
		STANDARD HARDWARE			
509	LK-9	HOSE CLAMP, 2-3/8" I.D. For air cleaner connections.	4		1
510	PD-77	NUT, 1/4"-20 thread, hexagon steel. For air cleaner clamp screws.	3		1
511	PD-78	NUT, 5/16"-18 thread, hexagon steel. For air cleaner strap mounting.	3		1
512	PE-3	LOCKWASHER, 1/4" Positive. For air cleaner clamp screws.	3		1
513	PE-4	LOCKWASHER, 5/16" Positive. For air cleaner strap mounting.	4		1
514	XA-74	SCREW, 1/4"-20 thread x 2-1/4" long, round head. For air cleaner strap clamping.	3		1
515	XD-14	SCREW, 5/16"-18 thread x 5/8" long, hexagon head. For air cleaner strap mounting.	4		1

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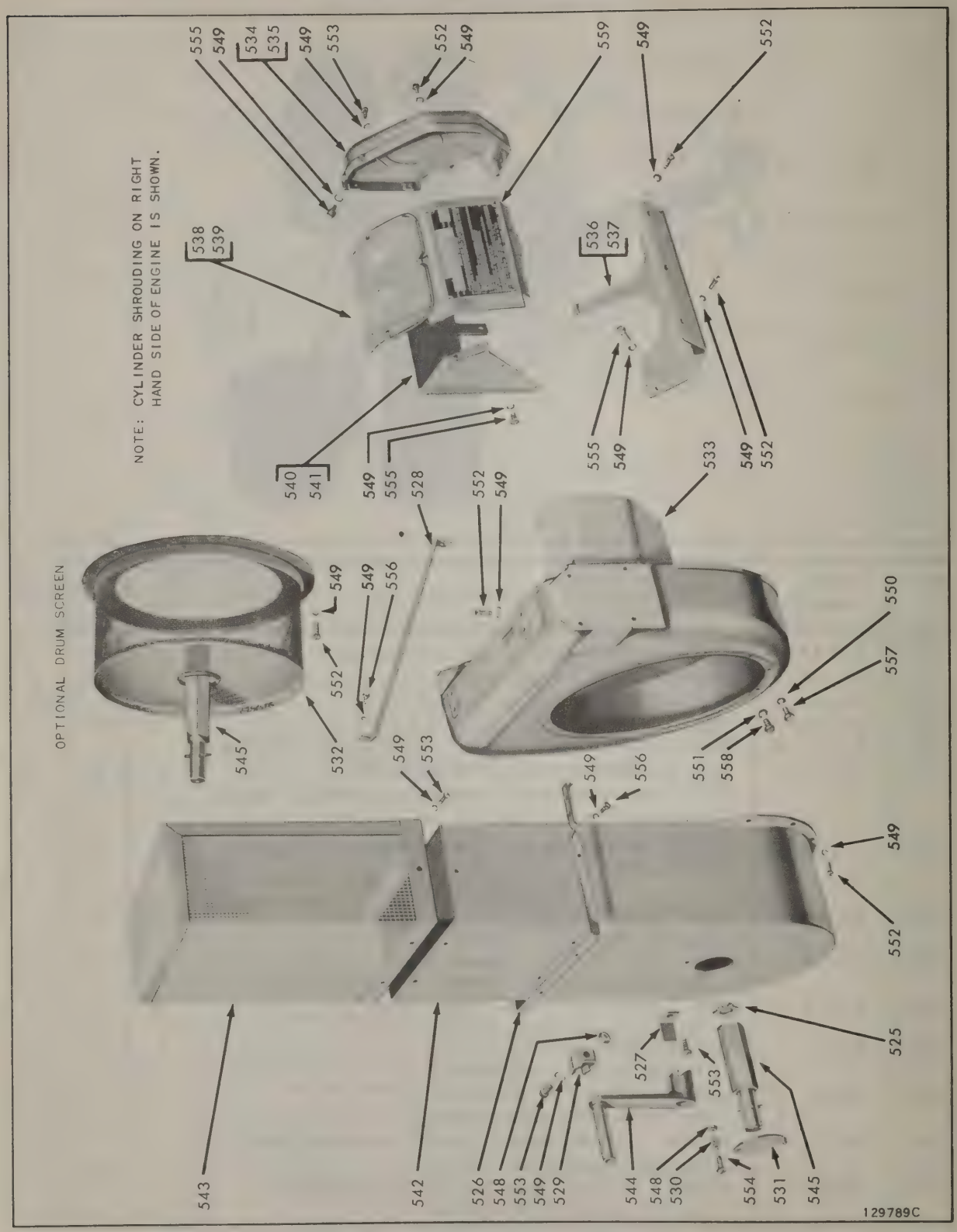
UPRIGHT AIR INTAKE, DRUM SCREEN AND AGRICULTURAL SHROUDING FOR VM4 AND VP4 ENGINES



Parts are identified by reference number. See parts list for correct part number.

UPRIGHT AIR INTAKE, DRUM SCREEN AND AGRICULTURAL SHROUDING FOR VM4 AND VP4 ENGINES

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
525	PE-65-1	LOCKWASHER for starting crank.	1		1
526	PG-472	SUPPORT STRAP for air intake stack.	1	1	8
527	PG-481	BRACKET for crank support.	1		3
528	PG-527	BRACE for air intake stack.	1		6
529	PK-87	SPRING CLIP for crank support.	1		1
530	PM-4	SPRING for crank hole cover.	1		1
531	SA-56	COVER for crank hole in air stack.	1		2
532	SE-48-B	DRUM TYPE INTAKE SCREEN	1	8	
533	SE-124-D	FLYWHEEL SHROUD (with pads for mounting upright air intake support and air cleaner mounting)	1	15	13
		SE-124-F (with pads for intake support, air cleaner and electric starter mounting)	1	16	3
534	SE-125-1	REAR SHROUD COVER ASSEMBLY right hand side.	1	1	8
535	SE-125A-1	REAR SHROUD COVER ASSEMBLY left hand side.	1	1	8
		The above assemblies both consist of:			
		PA-251-1 Pin for cleanout cover.	1		1
		PH-84 Washer for pin.	1		1
		PM-128 Spring for cleanout cover.	1		1
		SA-76 Cleanout cover.	1		4
		SE- Rear shroud cover (not furnished separately)	1		
		VE-481 Spring clip pin.	1		1
		XI-1 Cotter pin (1/16" x 1/2" long)	1		1
536	SE-126	LOWER CYLINDER SHROUD right hand side.	1		14
537	SE-126-A	LOWER CYLINDER SHROUD left hand side.	1		14
538	SE-127-1	COVER ASSEMBLY right hand side.	1	1	4
539	SE-127-A-1	COVER ASSEMBLY left hand side.	1	1	4
		The above assemblies both consist of:			
		PG-388 Clip for spring.	1		1
		PK-94 Spring	1		1
		SD-117 Instruction decal.	1		1
		SE- Cover (not furnished separately)	1		
		XJ-46 Rivets for clip mounting.	2		1

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UPRIGHT AIR INTAKE, DRUM SCREEN AND AGRICULTURAL SHROUDING FOR VM4 AND VP4 ENGINES

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
540	SE-128-B-1	CYLINDER HEAT DEFLECTOR ASSEMBLY R.H. side.	1	1	
		Consisting of:			
		SE-128-B Deflector.	1		15
		VE-481 Spring clip pin.	1		1
541	SE-128-C-1	CYLINDER HEAT DEFLECTOR ASSEMBLY L.H. side.	1	1	
		Consisting of:			
		SE-128-C Deflector.	1		15
		VE-481 Spring clip pin.	1		1
542	SE-139	AIR INTAKE STACK	1	25	
543	SE-140	SCREEN for air intake stack.	1	9	8
544	U-226-A	STARTING CRANK for engines with intake stack Use standard U-226 Crank for engines with drum screen.	1	2	8
545	UC-88-E-S1	STARTING CRANK NUT ASSEMBLY	1	4	
		Consisting of:			
		PA-275 Pin	1		1
		UC-88-E Nut.	1	3	15
		STANDARD HARDWARE			
548	PD-77	NUT, 1/4"-20 thread, hexagon steel 1-for crank support spring clip. 1-for crank hole cover.	2		1
549	PE-3	LOCKWASHER, 1/4" Positive. 6-for air stack screen. 36-for shrouding, stack and drum screen. 8-for stack support strap. 1-for crank support spring clip. 1-for air intake stack brace.	52		1
550	PE-4	LOCKWASHER, 5/16" Positive. For flywheel shroud to gear cover.	4		1
551	PE-5	LOCKWASHER, 3/8" Positive. For shroud to gear cover (center holes)	2		1

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UPRIGHT AIR INTAKE, DRUM SCREEN AND AGRICULTURAL SHROUDING FOR VM4 AND VP4 ENGINES

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
552	XA-33	SCREW, 1/4"-20 thread x 3/8" long, round head 8-for mounting drum screen. 4-for air intake stack. 4-for stack support strap. 12-for shroud covers and lower cylinder covers. 4-for lower covers to cylinder blocks. 2-for rear covers - lower holes.	34		1
553	XA-34	SCREW, 1/4"-20 thread x 1/2" long, round head 2-for rear shroud covers - upper holes. 2-for crank bracket and spring clip. 6-for air stack screen.	10		1
554	XA-35	SCREW, 1/4"-20 thread x 5/8" long, round head For crank hole cover.	1		1
555	XD-3	SCREW, 1/4"-20 thread x 3/8" long, hexagon head 2-for shroud to cylinder blocks. 4-for heat deflector to rear covers. 2-for lower cylinder covers to shroud.	8		1
556	XD-4	SCREW, 1/4"-20 thread x 1/2" long, hexagon head 4-for intake support strap. 1-for intake strap brace.	5		1
557	XD-13-1	SCREW, 5/16"-18 thread x 1/2" long, (1/8" thick, hex. head) For mounting flywheel shroud to gear cover.	4		1
558	XD-114	SCREW, 3/8"-16 thread x 5/8" long, hexagon head For flywheel shroud to gear cover.	2		1
559	XJ-46-A	RIVET, 9/64" dia. x 3/16" long, tubular steel For mounting name and instruction plate.	4		1

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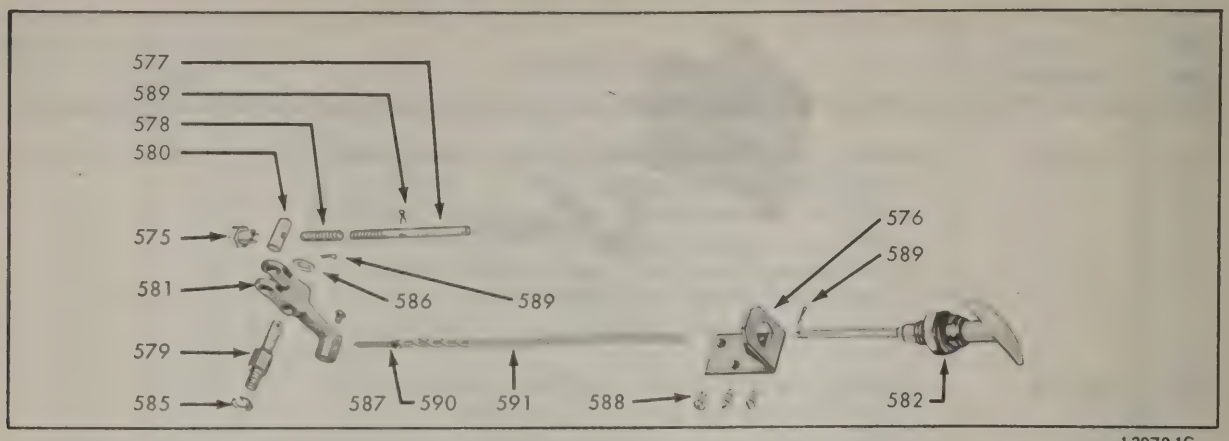
TT-61-C AND TT-61C-1 VARIABLE SPEED GOVERNOR CONTROL ASSEMBLIES FOR VM4 AND VP4 ENGINES



12979 1C

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
	TT-61-C	**GOVERNOR CONTROL ASSEMBLY** - for open engine.	1	1	2
	TT-61C-1	**GOVERNOR CONTROL ASSEMBLY** - for power unit.	1	1	
		NOTE: The following parts are identical on both of the above assemblies except PG-319-A-1 bracket is not furnished in TT-61C-1 assembly.			
575	PD-173-A	**LOCKNUT** for adjusting screw.	1		1
576	PG-319A-1	**BRACKET** for governor control.	1		2
577	PI-145-1	**ADJUSTING SCREW**	1		2
578	PM-111	**SPRING** for adjusting screw.	1		1
579	TC-365-D	**PIN** for lever support.	1		1
580	TC-368-A	**PIN** for adjusting screw swivel.	1		1
581	VB-134-A	**LEVER**	1		4
582	VE-527	**GOVERNOR CONTROL**	1		6
		STANDARD HARDWARE			
585	PE-3	**LOCKWASHER**, 1/4" Positive For support pin.	1		1
586	PH-77	**PLAIN WASHER**, 5/16" I.D. x 5/8" O.D. x 1/16" thick, steel For lever.	1		1
587	XA-62	**SCREW**, #8-32 thread x 1/4" long, round head For cotter pin in lever.	1		1
588	XA-65	**SCREW**, #8 x 1/2" long, self-tapping sheet metal For control bracket.	3		1
589	XI-1	**COTTER PIN**, 1/16" x 1/2" long 1-for lever pin. 1-for adjusting screw spring. 1-for chain at control.	3		1
590	XI-11	**COTTER PIN**, 3/32" x 1-1/4" long For chain at lever.	1		1
591		**#9100G GALVANIZED FURNACE CHAIN**, 12" long For control to lever.	1pc		1

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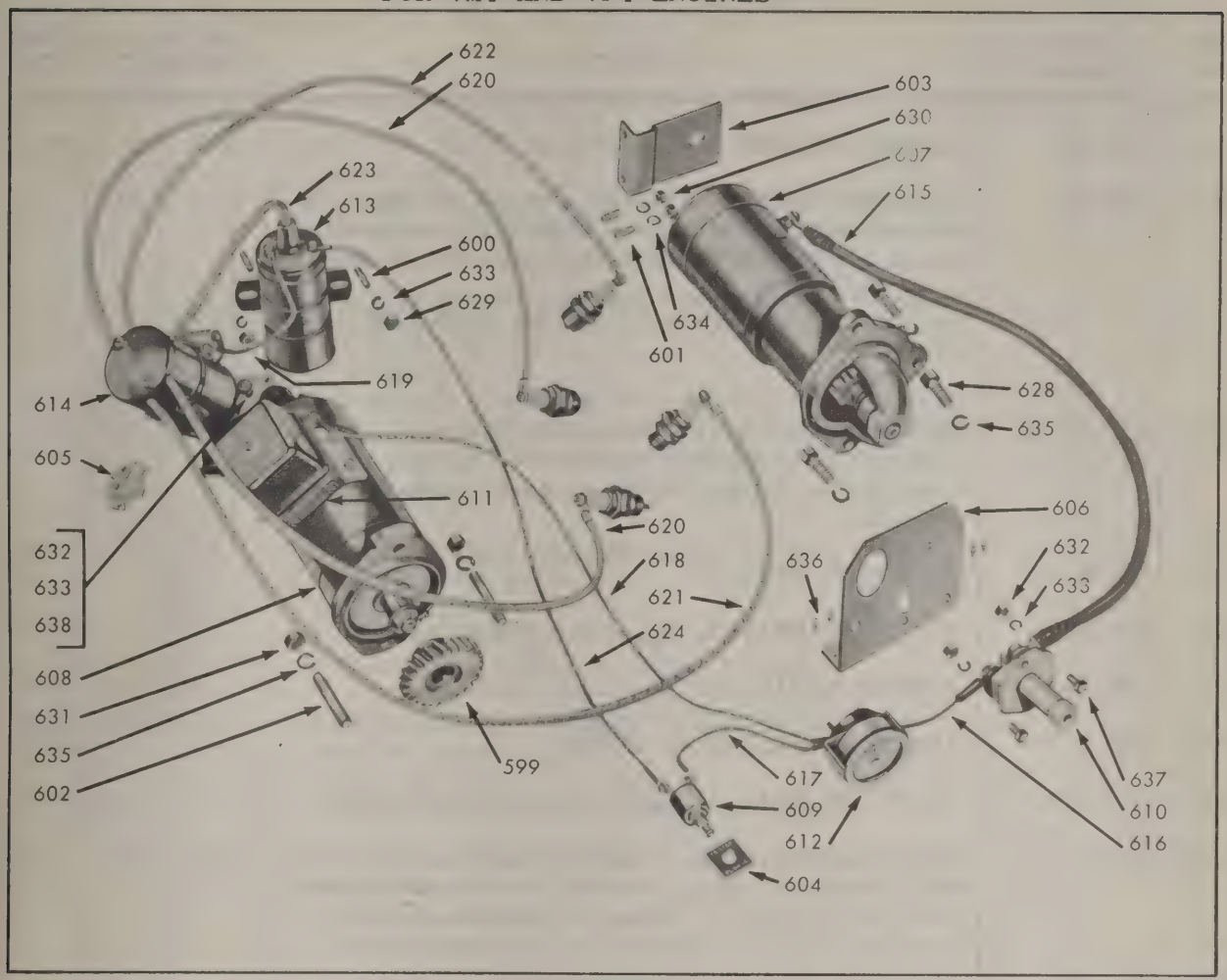
ELECTRIC STARTER, GENERATOR AND DISTRIBUTOR IGNITION FOR VM4 AND VP4 ENGINES



129790C

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
599	GD-107	**DRIVE GEAR** for generator.	1		8
600	PC-111	**STUD** for mounting ignition coil to case.	2		1
601	PC-396	**STUD** for mounting starter bracket.	2		1
602	PC-429	**STUD** for mounting generator.	2		2
603	PG-515	**SUPPORT BRACKET** for YA-10 starter. PG-439 Bracket for YA-4-B starter.	1		5 5
604	SD-109	**TAG** for ignition switch.	1		1
605	SD-141	**TAG** for distributor cap.	1		1

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ELECTRIC STARTER, GENERATOR AND DISTRIBUTOR IGNITION FOR VM4 AND VP4 ENGINES

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
606	VE-559	**CONTROL PANEL**	1		10
607	YA-10	**ELECTRIC STARTER** (6 volt), Auto-Lite #MZ-4118 YA-4-B Starter (Auto-Lite #MAK-4022) replaced by YA-10 but PG-515 Bracket must also be ordered. NOTE: For all repairs contact the Electric Auto-Lite Co. at Toledo, Ohio, or their nearest service station.	1	17	
608	YB-16-A	**GENERATOR** (6 volt), Auto-Lite #GAS-4301 NOTE: For all repairs contact the Electric Auto-Lite Co. at Toledo, Ohio, or their nearest service station.	1	15	6
609	YC-9	**IGNITION SWITCH**	1		2
610	YC-10	**STARTING SWITCH**, Auto-Lite #SW-4001.	1		4
611	YD-165	**JUMPER STRIP**, for generator regulator.	1		1
612	YE-2	**AMMETER**, Moto-Meter #5722A	1		6
613	YF-4-A	**IGNITION COIL** (6 volt), Auto-Lite #IG-6001	1	1	14
614	YF-6	**DISTRIBUTOR**, Auto-Lite #IGW-4159-A NOTE: For all repairs contact the Electric Auto-Lite Co. at Toledo, Ohio, or their nearest service station.	1	2	7
615	YL-130	**STARTER CABLE ASSEMBLY**, 26" long, starter to switch.	1		4
616	YL-131	**IGNITION WIRE ASSEMBLY**, 5" long, switch to ammeter Consisting of: 1 Terminal, H.B. Sherman #15 (13/32" dia. hole) 1 Terminal, Thomas & Betts #B-36 (13/64" dia. hole) 1 Insulator, 3/16" I.D. x 1" long, flexible tubing. 1 Insulator, 5/32" I.D. x 5/8" long, flexible tubing. 1 Pc. #14GA. (Packard #52) cable, 5" long.	1		1
617	YL-132	**IGNITION WIRE ASSEMBLY**, 6" long, ammeter to switch Consisting of: 2 Terminals, Thomas & Betts #B-36 (13/64" dia. hole) 2 Insulators, 5/32" I.D. x 5/8" long, flexible tubing 1 Pc. #14GA. (Packard #52) cable, 6" long.	1		1

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ELECTRIC STARTER, GENERATOR AND DISTRIBUTOR IGNITION FOR VM4 AND VP4 ENGINES

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
618	YL-134	**IGNITION WIRE ASSEMBLY**, 22"long, ammeter to generator. Consisting of: 2 Terminals, Thomas & Betts #B-36 (13/64" dia. hole) 2 Insulators, 5/32" I.D. x 5/8"long, flexible tubing 1 PC. #14GA. (Packard #52) cable, 22" long.	1		2
619	YL-135	**IGNITION WIRE ASSEMBLY**, 24"long, coil to distributor. For open engines. Consisting of: 2 Terminals, Thomas & Betts #B-36 (13/64" dia. hole) 2 Insulators, 5/32" I.D. x 5/8"long, flexible tubing 1 PC. #14 GA. (Packard #52) cable, 24" long. **YL-132 WIRE**, 5"long - for power unit engines.	1		2
620	YL-153	**IGNITION CABLE ASSEMBLY**, distributor to No. 1 and No. 3 spark plugs. Consisting of: 1 PC. 7mm cable, 35" long. 1 Spark plug terminal, Rajah T/T #11.	2		2
621	YL-154	**IGNITION CABLE ASSEMBLY**, distributor to No. 2 spark plug. Consisting of: 1 PC. 7mm cable, 41" long. 1 Spark plug terminal, Rajah T/T #11.	1		2
622	YL-157	**IGNITION CABLE ASSEMBLY**, distributor to No. 4 spark plug. Consisting of: 1 PC. 7mm cable, 43" long. 1 Spark plug terminal, Rajah T/T #11.	1		2
623	YL-158	**IGNITION CABLE ASSEMBLY**, distributor to coil. Consisting of: 1 PC. 7mm cable, 30" long. 1 Terminal, H.B. Sherman Mfg. Co. #P-100.	1		1
624	YL-163	**IGNITION WIRE ASSEMBLY**, 27"long, coil to switch For open engines. Consisting of: 2 Terminals, Thomas & Betts #B-36 (13/64" dia. hole) 2 Insulators, 5/32" I.D. x 5/8"long, flexible tubing 1 PC- #14 GA. (Packard #52) cable, 27" long. **YL-132 WIRE**, 5" long - for power unit engines.	1		1

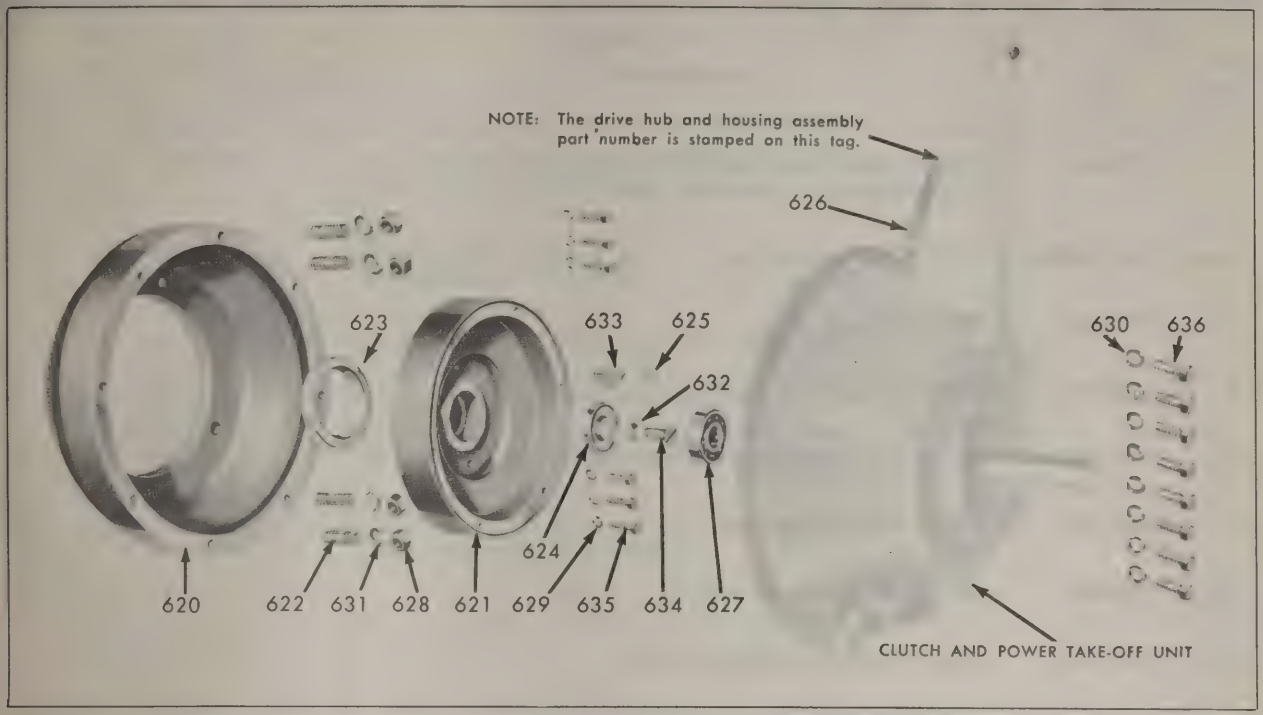
Order parts from nearest **SERVICE STATION** shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

ELECTRIC STARTER, GENERATOR AND DISTRIBUTOR IGNITION FOR VM4 AND VP4 ENGINES

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ
		STANDARD HARDWARE			
628	PB-24	SCREW, 3/8"-24 thread x 1-1/8"long, hexagon head. For mounting electric starter.	3		2
629	PD-9	NUT, 1/4"-28 thread, hexagon steel. For mounting ignition coil.	2		1
630	PD-10	NUT, 5/16"-24 thread, hexagon steel. For mounting starter bracket.	2		1
631	PD-11	NUT, 3/8"-24 thread, hexagon steel. For mounting generator.	2		1
632	PD-77	NUT, 1/4"-20 thread, hexagon steel. 2-for starter switch mounting. 1-for distributor advance lock.	3		1
633	PE-3	LOCKWASHER, 1/4" Positive. 2-for starter switch mounting. 2-for ignition coil mounting. 1-for distributor advance lock.	5		1
634	PE-4	LOCKWASHER, 5/16" Positive. For mounting starter bracket.	2		1
635	PE-5	LOCKWASHER, 3/8" Positive. 2-for mounting generator. 3-for mounting electric starter.	5		1
636	XA-73	SCREW, #7 x 3/8"long, self-tapping sheet metal. For mounting control panel.	4		1
637	XD-5	SCREW, 1/4"-20 thread x 5/8"long, hexagon head. For starter switch mounting.	2		1
638	XD-6	SCREW, 1/4"-20 thread x 3/4"long, hexagon head. For distributor advance lock.	1		1

Order parts from nearest **SERVICE STATION** shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

WW-83 CLUTCH DRIVE HUB AND HOUSING ASSEMBLY FOR ROCKFORD CLUTCH AND POWER TAKE-OFF UNIT ON VM4 AND VP4 ENGINES



99749C

The Above Assembly is Suitable for Mounting the Following Clutch and Power Take-off Unit

WISCONSIN MOTOR Part Number	ROCKFORD Part Number	Net Weight Lbs.	Net Weight Oz.	
WC-302-B (replaces WC-302)	**PTA-5822** (replaces PTA-5811)	55		
NOTE: See Rockford illustration and parts price list of Clutch and Power Take-off Parts.				

NOTE: Engines equipped with a Clutch and Power Take-off Unit require a special main bearing plate, crankshaft and crankcase as follows:

BG-194-1-S1 MAIN BEARING PLATE ASSEMBLY (not illustrated)
Consisting of:

1 BG-194-1 Bearing Plate
1 PH-278 Oil Seal

CA-59A-2-S1 CRANKSHAFT ASSEMBLY (not illustrated) for engines beginning with serial #771501 consisting of:

1—CA-59A-2 Crankshaft
1—GA-35A-1 Gear
2—ME-98 Bearings
1—PL-49 Key
1—RK-173 Oil Slinger

CA-59-2-S1 CRANKSHAFT ASSEMBLY for engines to and including serial #771500

THE PART NUMBER OF THE CRANKCASE CAN BE FOUND STAMPED ON THE TAKE-OFF END OF THE CRANKCASE ABOVE THE MAIN BEARING PLATE.

Order parts from nearest SERVICE STATION shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers shown on name plate.

WW-83 CLUTCH DRIVE HUB AND HOUSING ASSEMBLY FOR ROCKFORD CLUTCH AND POWER TAKE-OFF UNIT ON VM4 AND VP4 ENGINES

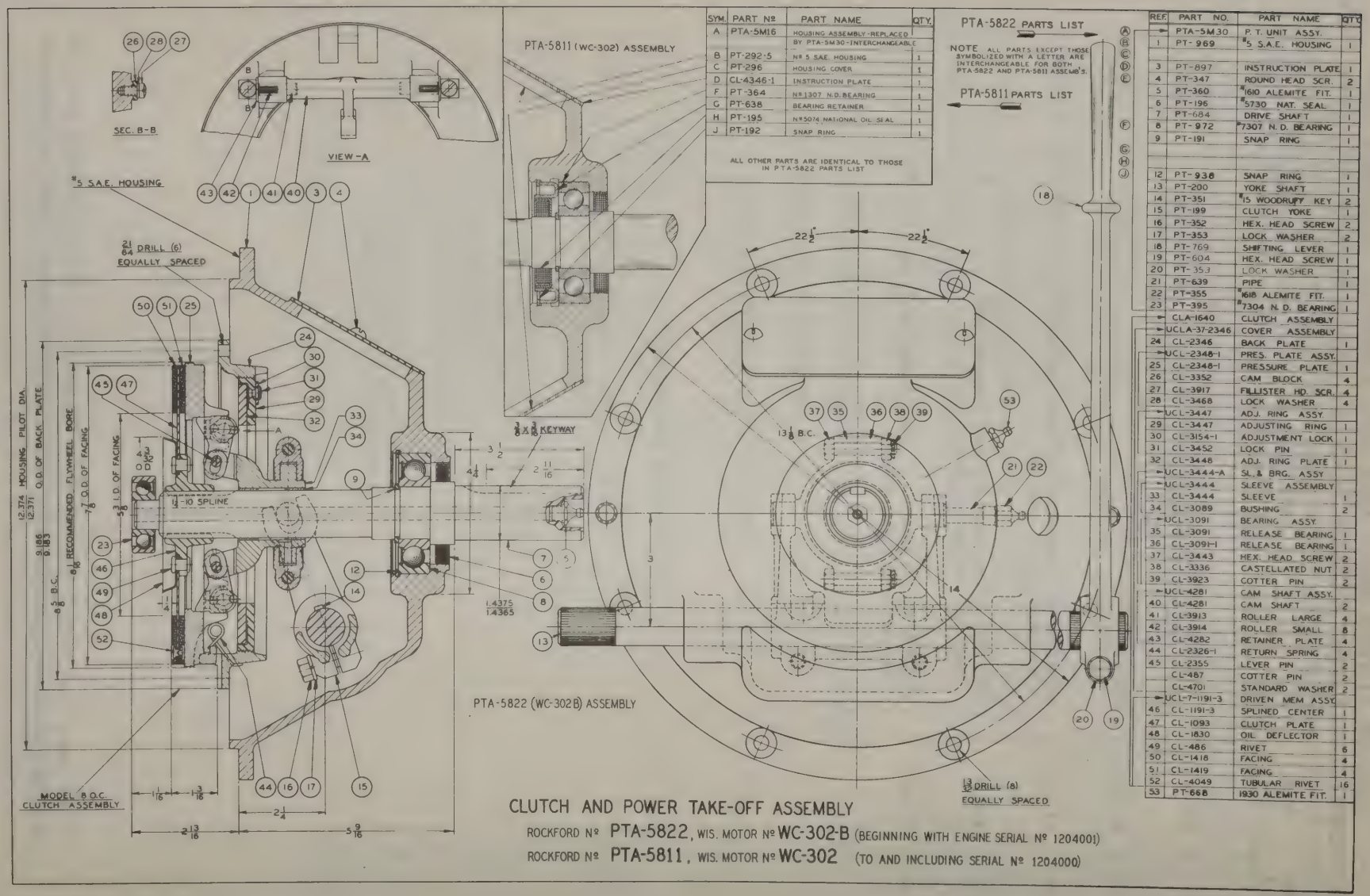
REF. NO.	PART NO.	DESCRIPTION	NO. REQ.	NET WEIGHT LBS.	NET WEIGHT OZ.
	WW-83	DRIVE HUB and HOUSING ASSEMBLY Consisting of the following parts:		50	
620	BO-169B-2	HOUSING— drive hub (#5 S. A. E.)	1	29	8
621	NC-149	DRIVE HUB	1	18	
622	PC-287	STUD—housing to crankcase mounting	4		2
623	PH-278	SEAL—main bearing (National Seal #55004)	1		3
624	PH-279	RETAINER—drive hub	1		3
625	QD-668	CORK SEAL—drive hub key	1		1
626	SD-79-B	ASSEMBLY NUMBER TAG	1		1
627		NEW DEPARTURE #7304 pilot bearing (Furnished with clutch)	1		8
		STANDARD HARDWARE			
628	PD-145	NUT, 5/8"-18 thread, hexagon steel For mounting housing to crankcase.	4		1
629	PE-4	LOCKWASHER, 5/16" positive For mounting clutch to drive hub.	6		1
630	PE-5	LOCKWASHER, 3/8" positive For mounting unit to housing.	8		1
631	PE-37	LOCKWASHER, 5/8" positive For mounting housing to crankcase.	4		1

Order parts from nearest SERVICE STATION shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers shown on name plate.

WW-83 CLUTCH DRIVE HUB AND HOUSING ASSEMBLY FOR ROCKFORD CLUTCH AND POWER TAKE-OFF UNIT ON VM4 AND VP4 ENGINES

REF. NO.	PART NO.	DESCRIPTION	NO. REQ.	NET WEIGHT LBS.	NET WEIGHT OZ.
632	PE-50	LOCKWASHER, 7/16" countersunk For mounting hub retainer.	1		1
633	PL-122	KEY, #25 Woodruff For mounting drive hub.	1		1
634	XC-22	SCREW, 7/16"-14 thread x 1 1/4" long, flat head For mounting hub retainer.	1		1
635	XD-17	SCREW, 5/16"-18 thread x 1" long, hexagon head For mounting clutch to drive hub.	6		1
636	XD-27	SCREW, 3/8"-16 thread x 1" long, hexagon head For mounting unit to housing.	8		1

Order parts from nearest SERVICE STATION shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers shown on name plate.



SYM.	PART Nº	PART NAME	QTY.
A	PTA-5M16	HOUSING ASSEMBLY-REPLACED BY PTA-5M30-INTERCHANGEABLE	
B	PT-292-5	Nº 5 SAE HOUSING	1
C	PT-296	HOUSING COVER	1
D	CL-4346-1	INSTRUCTION PLATE	1
F	PT-364	Nº 1307 N.D. BEARING	1
G	PT-638	BEARING RETAINER	1
H	PT-195	Nº 5074 NATIONAL OIL SEAL	1
J	PT-192	SNAP RING	1

ALL OTHER PARTS ARE IDENTICAL TO THOSE IN PTA-5822 PARTS LIST

PTA-5822 PARTS LIST

NOTE ALL PARTS EXCEPT THOSE SYMBOLIZED WITH A LETTER ARE INTERCHANGEABLE FOR BOTH PTA-5822 AND PTA-5811 ASSEMB'S.

PTA-5811 PARTS LIST

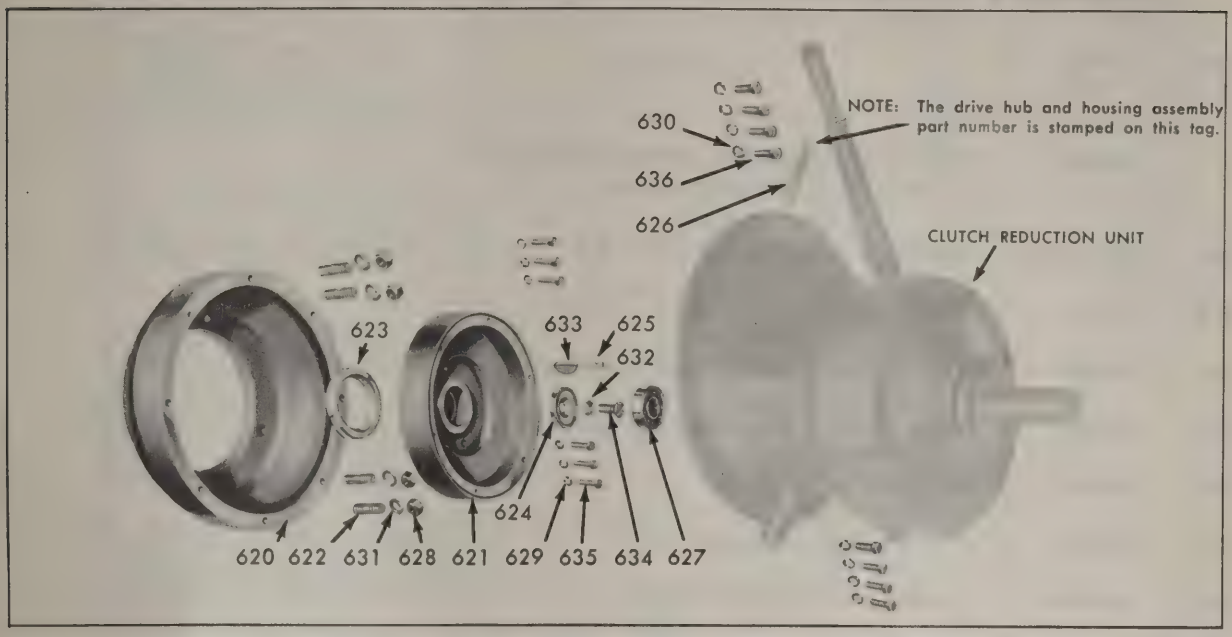
REF.	PART NO.	PART NAME	QTY.
	PTA-5M30	P.T. UNIT ASSY.	
1	PT-969	#5 S.A.E. HOUSING	1
3	PT-897	INSTRUCTION PLATE	1
4	PT-347	ROUND HEAD SCR.	2
5	PT-360	#1610 ALEMITE FIT.	1
6	PT-196	#5730 NAT. SEAL	1
7	PT-684	DRIVE SHAFT	1
8	PT-972	7307 N.D. BEARING	1
9	PT-191	SNAP RING	1
12	PT-938	SNAP RING	1
13	PT-200	YOKE SHAFT	1
14	PT-351	#15 WOODRUFF KEY	2
15	PT-199	CLUTCH YOKE	1
16	PT-352	HEX. HEAD SCREW	2
17	PT-353	LOCK WASHER	2
18	PT-769	SHIFTING LEVER	1
19	PT-604	HEX. HEAD SCREW	1
20	PT-353	LOCK WASHER	1
21	PT-639	PIPE	1
22	PT-355	#1618 ALEMITE FIT.	1
23	PT-395	#7304 N.D. BEARING	1
►	CLA-1640	CLUTCH ASSEMBLY	
►	UCLA-37-2346	COVER ASSEMBLY	
24	CL-2346	BACK PLATE	1
►	UCL-2348-1	PRES. PLATE ASSY.	
25	CL-2348-1	PRESSURE PLATE	1
26	CL-3352	CAM BLOCK	4
27	CL-3917	FILLISTER HD. SCR.	4
28	CL-3468	LOCK WASHER	4
►	UCL-3447	ADJ. RING ASSY.	
29	CL-3447	ADJUSTING RING	1
30	CL-3154-1	ADJUSTMENT LOCK	1
31	CL-3452	LOCK PIN	1
32	CL-3448	ADJ. RING PLATE	1
►	UCL-3444-A	SL. & BRG. ASSY	
►	UCL-3444	SLEEVE ASSEMBLY	
33	CL-3444	SLEEVE	1
34	CL-3089	BUSHING	2
►	UCL-3091	BEARING ASSY.	
35	CL-3091	RELEASE BEARING	1
36	CL-3091-1	RELEASE BEARING	1
37	CL-3443	HEX. HEAD SCREW	2
38	CL-3336	CASTELLATED NUT	2
39	CL-3923	COTTER PIN	2
►	UCL-4281	CAM SHAFT ASSY.	
40	CL-4281	CAM SHAFT	2
41	CL-3913	ROLLER LARGE	4
42	CL-3914	ROLLER SMALL	8
43	CL-4282	RETAINER PLATE	4
44	CL-2326-1	RETURN SPRING	4
45	CL-2355	LEVER PIN	2
	CL-487	COTTER PIN	2
	CL-4701	STANDARD WASHER	2
►	UCL-7-1191-3	DRIVEN MEM ASSY.	
46	CL-1191-3	SPLINED CENTER	1
47	CL-1093	CLUTCH PLATE	1
48	CL-1830	OIL DEFLECTOR	1
49	CL-486	RIVET	6
50	CL-1418	FACING	4
51	CL-1419	FACING	4
52	CL-4049	TUBULAR RIVET	16
53	PT-668	1930 ALEMITE FIT.	1

CLUTCH AND POWER TAKE-OFF ASSEMBLY

ROCKFORD Nº **PTA-5822**, WIS. MOTOR Nº **WC-302-B** (BEGINNING WITH ENGINE SERIAL Nº 1204001)

ROCKFORD Nº **PTA-5811**, WIS. MOTOR Nº **WC-302** (TO AND INCLUDING SERIAL Nº 1204000)

WW-83 CLUTCH DRIVE HUB AND HOUSING ASSEMBLY FOR ROCKFORD CLUTCH REDUCTION UNITS ON VM4 AND VP4 ENGINES



The Above Assembly is Suitable for Mounting the Following Clutch Reduction Units

104571C

Wisconsin Motor Part Number	Rockford Part Number	Reduction Ratio	Rotation at Take-Off Shaft	Net Weight Lbs.	Net Weight Oz.
WC-314	GRA-586	2.05 to 1	Counter-Engine-wise	80	
WC-315	GRA-589	2.50 to 1	Counter-Engine-wise	82	
WC-316	GRA-584	3.90 to 1	Counter-Engine-wise	85	

NOTE: See Rockford illustration and parts price list for clutch reduction unit parts.

NOTE: Engines equipped with a clutch reduction unit require a special main bearing plate, crankshaft and crankcase as follows:

BG-194-1-S1 MAIN BEARING PLATE ASSEMBLY (not illustrated)

consisting of:

1—BG-194-1 Bearing Plate 1—PH-278 Oil Seal

CA-59A-2-S1 CRANKSHAFT ASSEMBLY (not illustrated) for engines beginning with serial #771501

consisting of:

1—CA-59A-2 Crankshaft 1—PL-49 Key

1—GA-35A-1 Gear 1—RK-173 Oil Slinger

2—ME-98 Bearings

CA-59-2-S1 CRANKSHAFT ASSEMBLY for engines to and including serial #771500

THE PART NUMBER OF THE CRANKCASE CAN BE FOUND STAMPED ON THE TAKE-OFF END OF THE CRANKCASE ABOVE THE MAIN BEARING PLATE.

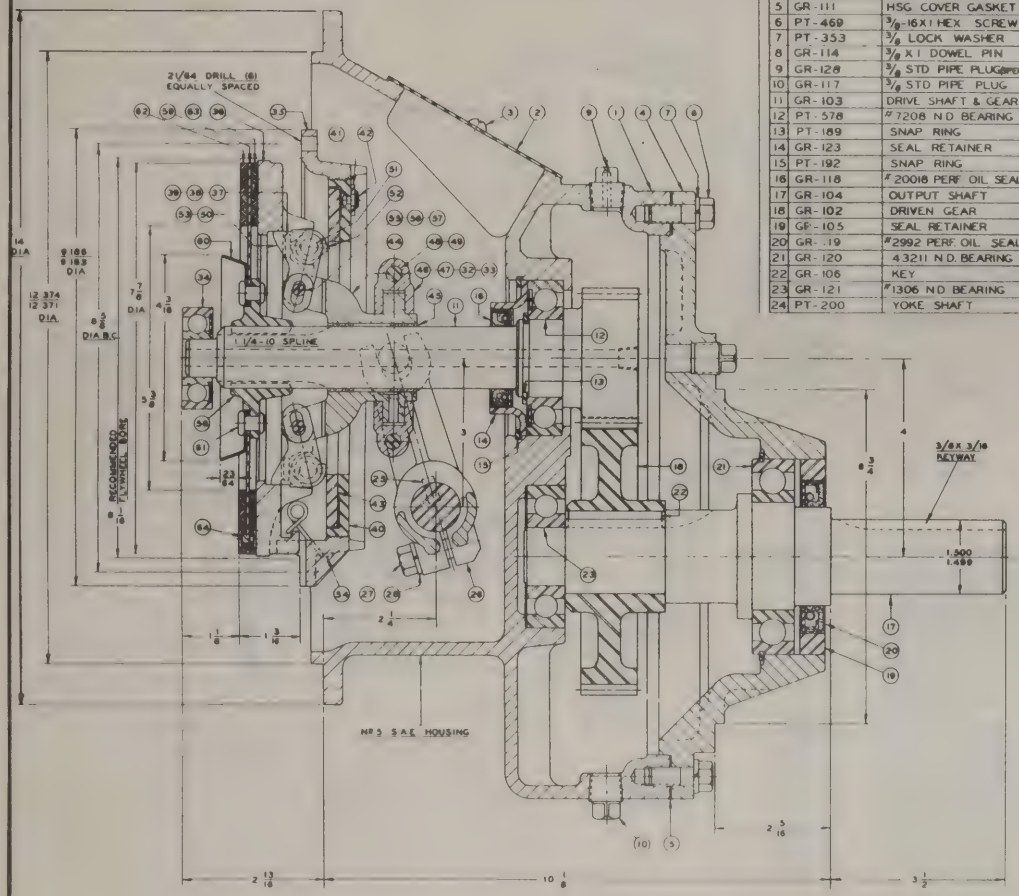
Order parts from nearest SERVICE STATION shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers shown on name plate.

WW-83 CLUTCH DRIVE HUB AND HOUSING ASSEMBLY FOR ROCKFORD CLUTCH REDUCTION UNITS ON VM4 AND VP4 ENGINES

REF. NO.	PART NO.	DESCRIPTION	NO. REQ.	NET WEIGHT LBS.	NET WEIGHT OZ.
	WW-83	**DRIVE HUB and HOUSING ASSEMBLY** Consisting of the following parts:			
620	BO-169B-2	HOUSING—drive hub (#5 S. A. E.)	1	29	8
621	NC-149	DRIVE HUB	1	18	
622	PC-287	STUD—housing to crankcase mounting	4		2
623	PH-278	SEAL—main bearing (National Seal #55004)	1		3
624	PH-279	RETAINER—drive hub	1		3
625	QD-668	CORK SEAL—drive hub key	1		1
626	SD-79-B	ASSEMBLY NUMBER TAG	1		1
627		NEW DEPARTURE #7304 pilot bearing (Furnished with clutch)	1		8
		STANDARD HARDWARE			
628	PD-145	NUT, 5/8"-18 thread, hexagon steel For mounting housing to crankcase.	4		1
629	PE-4	LOCKWASHER, 5/16" positive For mounting clutch to drive hub.	6		1
630	PE-5	LOCKWASHER, 3/8" positive For mounting unit to housing.	8		1
631	PE-37	LOCKWASHER, 5/8" positive. For mounting housing to crankcase.	4		1
632	PE-50	LOCKWASHER, 7/16" countersunk For mounting hub retainer.	1		1
633	PL-122	KEY, #25 Woodruff For mounting drive hub.	1		1
634	XC-22	SCREW, 7/16"-14 thread x 1 1/4" long, flat head For mounting hub retainer.	1		1
635	XD-17	SCREW, 5/16"-18 thread x 1" long, hexagon head For mounting clutch to drive hub.	6		1
636	XD-27	SCREW, 3/8"-16 thread x 1" long, hexagon head For mounting unit to housing.	8		1

Order parts from nearest SERVICE STATION shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers shown on name plate.

WC-314 ROCKFORD CLUTCH REDUCTION GEAR ASSEMBLY FOR VM4 AND VP4 ENGINES


2 1/64 DRILL (8) EQUALLY SPACED
1/4-10 SPLINE
RECOMMENDED FLYWHEEL BORE
NO 3 S.A.E. HOUSING
3/8 X 3/16 KEYWAY
13/32 DRILL (8) EQUALLY SPACED
OIL LEVEL PLUG USE S.A.E. 30 OIL
5/16-18 N.C. TAP 1/2 DEEP (8) HOLES EQUALLY SPACED FOR SUPPORT PLATE

REF	PART NO	PART NAME	QTY
—	GRA-5M6	ASSEMBLY	
1	GR-100	#3 S.A.E. HOUSING	1
2	GR-124	INSTRUCTION PLATE	1
3	PT-347	1/4-20 X 3/8 RD HD SCR	2
4	GR-101	HOUSING COVER	1
5	GR-111	HSG. COVER GASKET	1
6	PT-469	3/8-16 X 1 HEX. SCREW	8
7	PT-353	3/8 LOCK WASHER	8
8	GR-114	3/8 X 1 DOWEL PIN	1
9	GR-128	3/8 STD PIPE PLUG (SPEC)	1
10	GR-117	3/8 STD PIPE PLUG	3
11	GR-103	DRIVE SHAFT & GEAR	1
12	PT-578	#7208 N.D. BEARING	1
13	PT-189	SNAP RING	1
14	GR-123	SEAL RETAINER	1
15	PT-192	SNAP RING	1
16	GR-118	#20018 PERF. OIL SEAL	1
17	GR-104	OUTPUT SHAFT	1
18	GR-102	DRIVEN GEAR	1
19	GR-105	SEAL RETAINER	1
20	GR-119	#2992 PERF. OIL SEAL	1
21	GR-120	43211 N.D. BEARING	1
22	GR-106	KEY	1
23	GR-121	#1306 N.D. BEARING	1
24	PT-200	YOKE SHAFT	1

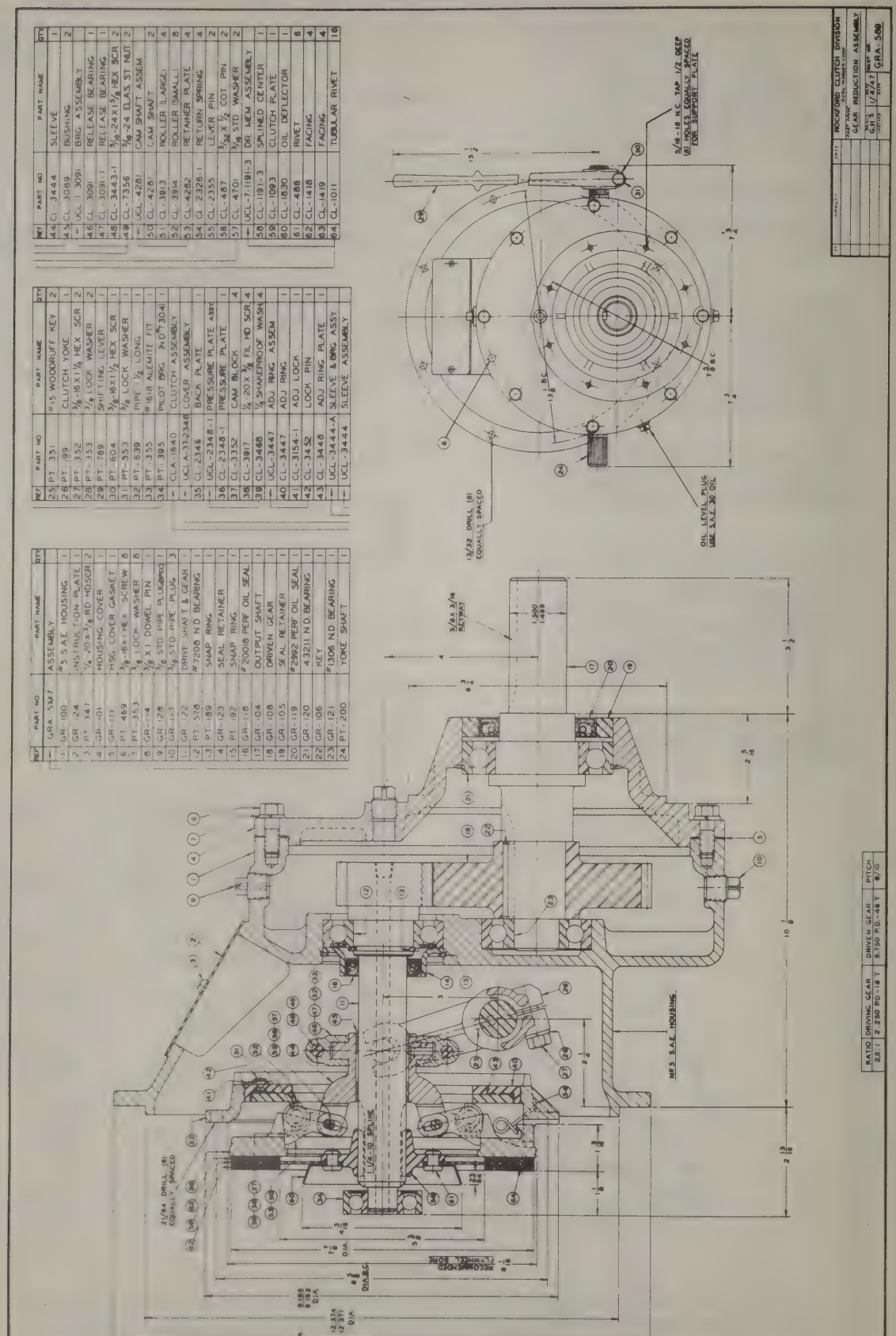
REF	PART NO	PART NAME	QTY
25	PT-351	#15 WOODRUFF KEY	2
26	PT-199	CLUTCH YOKE	1
27	PT-352	3/8-16 X 1 1/4 HEX. SCR.	2
28	PT-353	3/8 LOCK WASHER	2
29	PT-769	SHIFTING LEVER	1
30	PT 604	3/8-16 X 1 1/2 HEX SCR	1
31	PT-353	3/8 LOCK WASHER	1
32	PT-639	PIPE 1 1/2 LONG	1
33	PT-355	#1618 ALEMITE FIT	1
34	PT-395	PILOT BRG (NDH7304)	1
—	CLA-1640	CLUTCH ASSEMBLY	
—	UCLA-37-2346	COVER ASSEMBLY	
35	CL 2346	BACK PLATE	1
—	UCL-2348-1	PRESSURE PLATE ASSY.	
36	CL-2348-1	PRESSURE PLATE	1
37	CL-3352	CAM BLOCK	4
38	CL-3917	1/4-20 X 3/8 FIL. HD. SCR	4
39	CL-3468	1/4 SHAKEPROOF WASH	4
—	UCL-3447	ADJ RING ASSEM	
40	CL-3447	ADJ RING	1
41	CL-3154-1	ADJ LOCK	1
42	CL-3452	LOCK PIN	1
43	CL-3448	ADJ RING PLATE	1
—	UCL-3444-A	SLEEVE & BRG ASSY	
—	UCL-3444	SLEEVE ASSEMBLY	

REF	PART NO	PART NAME	QTY
44	CL-3444	SLEEVE	1
45	CL-3089	BUSHING	2
—	UCL-1-3091	BRG. ASSEMBLY	
46	CL-3091	RELEASE BEARING	1
47	CL-3091-1	RELEASE BEARING	1
48	CL-3443-1	5/16-24 X 5/8 HEX SCR	2
49	CL-7356	5/16-24 ELAS. ST NUT	2
—	UCL-4281	CAM SHAFT ASSEM.	
50	CL-4281	CAM SHAFT	2
51	CL-3913	ROLLER (LARGE)	4
52	CL-3914	ROLLER (SMALL)	8
53	CL-4282	RETAINER PLATE	4
54	CL-2326-1	RETURN SPRING	4
55	CL-2355	LEVER PIN	2
56	CL-487	3/32 X 1/2 COT. PIN	2
57	CL-4701	3/16 STD WASHER	2
—	UCL-7-1191-3	DR MEM ASSEMBLY	
58	CL-1191-3	SPLINED CENTER	1
59	CL-1093	CLUTCH PLATE	1
60	CL-1830	OIL DEFLECTOR	1
61	CL-486	RIVET	8
62	CL-1418	FACING	4
63	CL-1419	FACING	4
64	CL-1011	TUBULAR RIVET	16

RATIO	DRIVING GEAR	DRIVEN GEAR	PITCH
2.09:1	2 823 PD 21 T	5.375 P.D. - 46 T	8/10

ROCKFORD CLUTCH DIVISION
GEAR REDUCTION ASSEMBLY
G.M.S. 1/4/47
PART NO GRA-588

WC-315 ROCKFORD CLUTCH REDUCTION GEAR ASSEMBLY FOR VM4 AND VP4 ENGINES


ROCKFORD CLUTCH DIVISION
GEAR REDUCTION ASSEMBLY
GRA-500
5/8-18 N.C. TAP 1/2 DEEP @ HOLES EQUALLY SPACED FOR SUPPORT PLATE
13/32 DRILL (8) EQUALLY SPACED
OIL LEVEL PLUG USE S.A.E. 30 OIL
M-3 S.A.E. HOUSING
RECOMMENDED FLYWHEEL BORE
21/64 DRILL (8) EQUALLY SPACED
1/4-18 SPLINE
RATIO 2.5:1
DRIVING GEAR 2.250 P.D.-18 T
DRIVEN GEAR 5.730 P.D.-46 T
PITCH 8/10

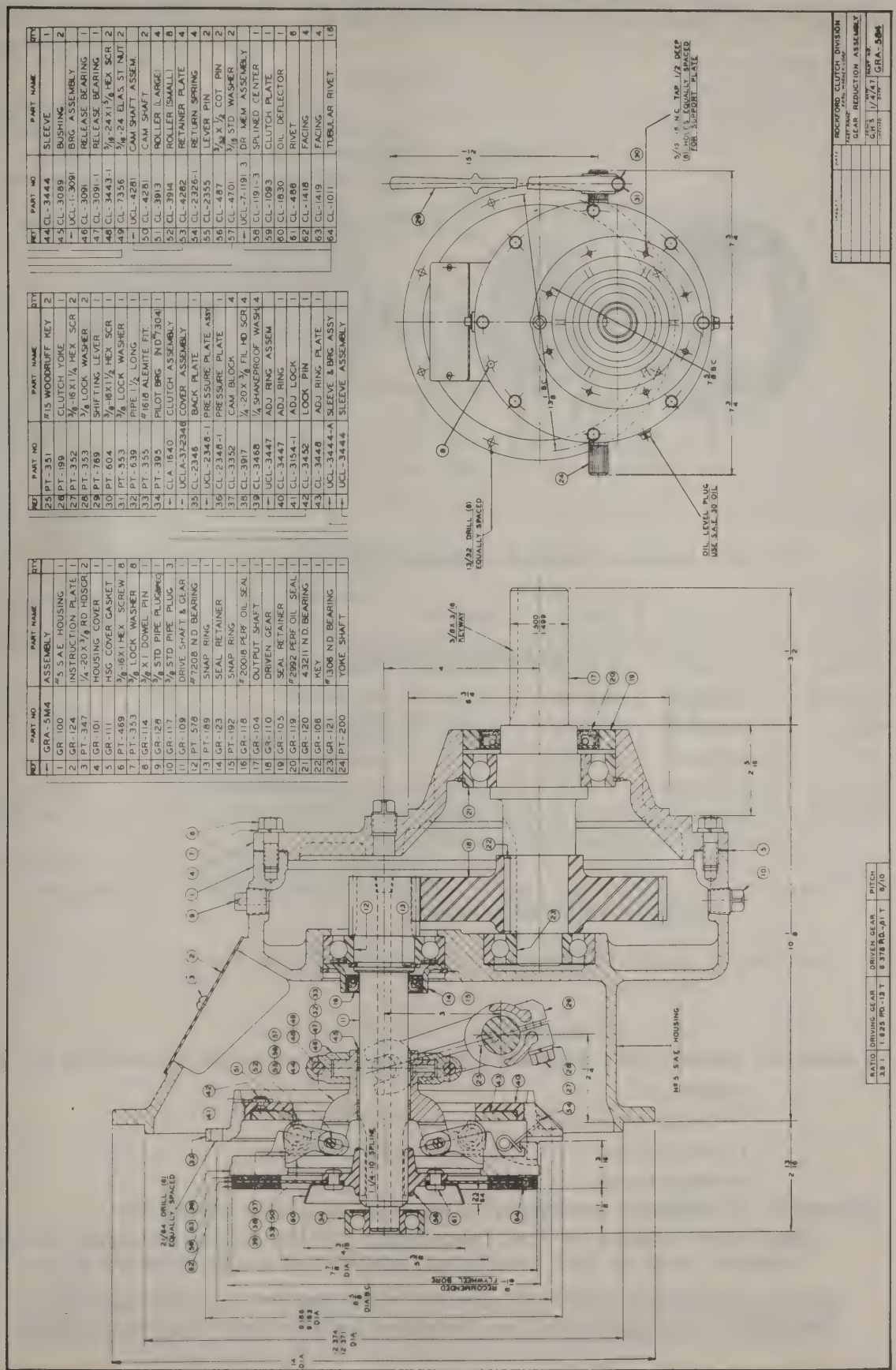
REF	PART NO	PART NAME	QTY
1	GRA-5X47	ASSEMBLY	
—	GR-100	#5 S.A.E. HOUSING	1
2	GR-124	INSTRUCTION PLATE	1
3	PT-347	1/4-20 X 3/8 RD HDSCR	2
4	GR-101	HOUSING COVER	1
5	GR-111	HSG. COVER GASKET	1
6	PT-469	3/8-16 X 1 HEX SCREW	8
7	PT-353	3/8 LOCK WASHER	8
8	GR-114	3/8 X 1 DOWEL PIN	1
9	GR-128	1/8 STD PIPE PLUG	1
10	GR-117	3/8 STD PIPE PLUG	3
11	GR-122	DRIVE SHAFT & GEAR	1
12	PT-378	#7208 N.D. BEARING	1
13	PT-189	SNAP RING	1
14	GR-123	SEAL RETAINER	1
15	PT-192	SNAP RING	1
16	GR-116	#20016 PERF. OIL SEAL	1
17	GR-104	OUTPUT SHAFT	1
18	GR-108	DRIVEN GEAR	1
19	GR-105	SEAL RETAINER	1
20	GR-119	#2992 PERF. OIL SEAL	1
21	GR-120	43211 N.D. BEARING	1
22	GR-106	KEY	1
23	GR-121	#1306 N.D. BEARING	1
24	PT-200	YOKE SHAFT	1

REF	PART NO	PART NAME	QTY
24	PT-351	#15 WOODRUFF KEY	2
25	PT-199	CLUTCH YOKE	1
27	PT-352	3/8-16 X 1 HEX SCR	2
28	PT-353	3/8 LOCK WASHER	2
29	PT-769	SHIFTING LEVER	1
30	PT-604	3/8-16 X 1 1/2 HEX SCR	1
31	PT-353	3/8 LOCK WASHER	1
32	PT-639	PIPE 1/2 LONG	1
33	PT-355	#1618 ALEMITE FIT	1
34	PT-395	PILOT BRG. #NO304	1
—	CLA-1640	CLUTCH ASSEMBLY	1
—	UCL-A-37-2346	COVER ASSEMBLY	1
35	CL-2346	BACK PLATE	1
—	UCL-2348-1	PRESSURE PLATE ASSY.	1
36	CL-2348-1	PRESSURE PLATE	1
37	CL-3352	CAM BLOCK	4
38	CL-3017	1/4 - 20 X 3/8 FIL HD SCR.	4
39	CL-3448	1/4 SHAKEPROOF WASH.	4
—	UCL-3447	ADJ. RING ASSEM.	1
40	CL-3447	ADJ. RING	1
41	CL-3154-1	ADJ. LOCK	1
42	CL-3452	LOCK PIN	1
43	CL-3448	ADJ. RING PLATE	1
—	UCL-3444-A	SLEEVE & BRG. ASSY.	1
—	UCL-3444	SLEEVE ASSEMBLY	1

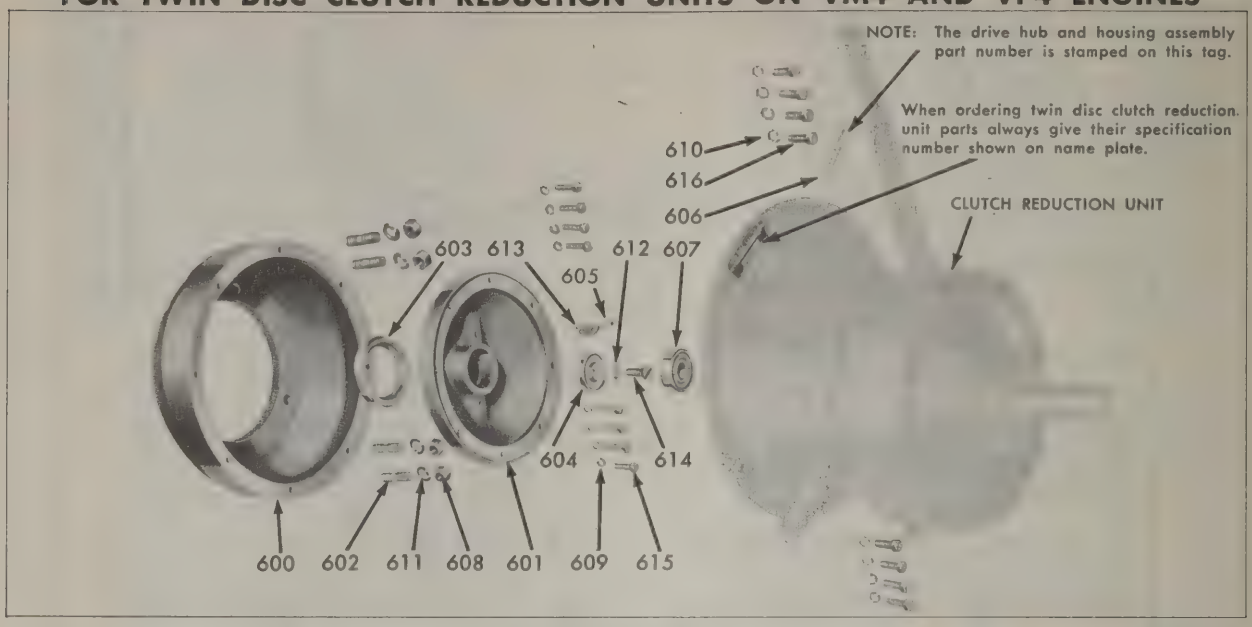
REF	PART NO	PART NAME	QTY
44	CL-3444	SLEEVE	1
45	CL-3089	BUSHING	2
—	UCL-1-3091	BRG. ASSEMBLY	1
46	CL-3091	RELEASE BEARING	1
47	CL-3091-1	RELEASE BEARING	1
48	CL-3443-1	5/16-24 X 1 3/4 HEX SCR	2
49	CL-7356	5/16-24 ELAS. ST. NUT	2
—	UCL-4281	CAM SHAFT ASSEM.	
50	CL-4281	CAM SHAFT	2
51	CL-3913	ROLLER (LARGE)	4
52	CL-3914	ROLLER (SMALL)	6
53	CL-4282	RETAINER PLATE	4
54	CL-2326-1	RETURN SPRING	4
55	CL-2355	LEVER PIN	2
56	CL-487	3/32 X 1/2 COT PIN	2
57	CL-4701	3/8 STD. WASHER	2
—	UCL-7-1191-3	DR. MEM. ASSEMBLY	
58	CL-1191-3	SPLINED CENTER	1
59	CL-1093	CLUTCH PLATE	1
60	CL-1830	OIL DEFLECTOR	1
61	CL-486	RIVET	6
62	CL-1418	FACING	4
63	CL-1419	FACING	4
64	CL-1011	TUBULAR RIVET	16

WC-316 ROCKFORD CLUTCH REDUCTION GEAR ASSEMBLY FOR VM4 AND VP4 ENGINES

REF	PART NO	PART NAME	QTY
—	GRA-5M4	ASSEMBLY	
1	GR-100	#5 S.A.E. HOUSING	1
2	GR-124	INSTRUCTION PLATE	1
3	PT-347	1/4-20 X 3/4 RD HDSCR	2
4	GR-101	HOUSING COVER	1
5	GR-111	HSG COVER GASKET	1
6	PT-469	3/8-16 X 1 HEX SCREW	8
7	PT-353	3/8 LOCK WASHER	8
8	GR-114	1/4 X 1 DOWEL PIN	1
9	GR-128	3/8 STD PIPE PLUG (MAG)	1
10	GR-117	3/8 STD PIPE PLUG	3
11	GR-109	DRIVE SHAFT & GEAR	1
12	PT-578	#7208 N.D. BEARING	1
13	PT-189	SNAP RING	1
14	GR-123	SEAL RETAINER	1
15	PT-192	SNAP RING	1
16	GR-118	#2001B PERF OIL SEAL	1
17	GR-104	OUTPUT SHAFT	1
18	GR-110	DRIVEN GEAR	1
19	GR-105	SEAL RETAINER	1
20	GR-119	#2992 PERF OIL SEAL	1
21	GR-120	4.3211 N.D. BEARING	1
22	GR-106	KEY	1
23	GR-121	#306 N.D. BEARING	1
24	PT-200	YOKE SHAFT	1
25	PT-351	#15 WOODRUFF KEY	2
26	PT-199	CLUTCH YOKE	1
27	PT-352	3/8-16 X 1 1/4 HEX SCR	2
28	PT-353	3/8 LOCK WASHER	2
29	PT-769	SHIFTING LEVER	1
30	PT-604	3/4-16 X 1 1/2 HEX SCR	1
31	PT-353	3/8 LOCK WASHER	1
32	PT-639	PIPE 1 1/2 LONG	1
33	PT-355	#1618 ALEMITE FIT.	1
34	PT-395	PILOT BRG N.D. 304	1
—	CLA-1640	CLUTCH ASSEMBLY	
—	UCLA-37-2346	COVER ASSEMBLY	
35	CL-2346	BACK PLATE	1
—	UCL-2348-1	PRESSURE PLATE ASST	
36	CL-2346-1	PRESSURE PLATE	1
37	CL-3352	CAM BLOCK	4
38	CL-3917	1/4-20 X 3/8 FIL HD SCR	4
39	CL-3468	1/4 SHAKEPROOF WASH	4
—	UCL-3447	ADJ RING ASSEM	
40	CL-3447	ADJ. RING	1
41	CL-3154-1	ADJ LOCK	1
42	CL-3432	LOCK PIN	1
43	CL-3448	ADJ RING PLATE	1
—	UCL-3444-A	SLEEVE & BRG ASSY	
—	UCL-3444	SLEEVE ASSEMBLY	
44	CL-3444	SLEEVE	1
45	CL-3089	BUSHING	2
—	UCL-1-3091	BRG ASSEMBLY	
46	CL-3091	RELEASE BEARING	1
47	CL-3091-1	RELEASE BEARING	1
48	CL-3443-1	1/2-24 X 3/4 HEX SCR	2
49	CL-7356	1/2-24 CLAS. ST NUT	2
—	UCL-4281	CAM SHAFT ASSEM.	
50	CL-4281	CAM SHAFT	2
51	CL-3913	ROLLER (LARGE)	4
52	CL-3914	ROLLER (SMALL)	8
53	CL-4262	RETAINER PLATE	4
54	CL-2326-1	RETURN SPRING	4
55	CL-2355	LEVER PIN	2
56	CL-487	3/32 X 1/2 COT PIN	2
57	CL-4701	1/2 STD WASHER	2
—	UCL-7-1191-3	DR. KEW ASSEMBLY	
58	CL-1191-3	SPLINED CENTER	1
59	CL-1093	CLUTCH PLATE	1
60	CL-1830	OIL DEFLECTOR	1
61	CL-488	RIVET	6
62	CL-1418	FACING	4
63	CL-1419	FACING	4
64	CL-1011	TUBULAR RIVET	16


ROCKFORD CLUTCH DIVISION
GEAR REDUCTION ASSEMBLY
GRA-5M4
RATIO 3.81
DRIVING GEAR 19 T
DRIVEN GEAR 6.378 PD-2 PIT
PITCH 6/10
#5 S.A.E. HOUSING
13/32 DRILL (8) EQUALLY SPACED
5/16 - 18 N.C. TAP 1/2 DEEP (8) HOLES EQUALLY SPACED FOR SUPPORT PLATE
OIL LEVEL PLUG USE S.A.E. 30 OIL
2 1/64 DRILL (8) EQUALLY SPACED
1/4-10 SPLINE
RECOMMENDED FLYWHEEL BORE

WW-80 DRIVE HUB AND HOUSING ASSEMBLY
FOR TWIN DISC CLUTCH REDUCTION UNITS ON VM4 AND VP4 ENGINES



The Above Assembly is Suitable for Mounting the Following Clutch Reduction Units

Wis. Motor Part No.	Twin Disc C-7½, Model	Twin Disc Drawing No.	Reduction Ratio	Rotation at Take-Off Shaft	Net Weight Lbs.	Net Weight Oz.
WC-249-1	C 107E2RG5	X 8515	2.56 to 1	Engine-wise	89	
WC-250-1	C 107E3RG5	X 8515	3.60 to 1	Engine-wise	90	
WC-251-1	C 107E5RG5	X 8516	4.90 to 1	Engine-wise	92	
WC-252-1	C 107A2RG5	X 8518	2.50 to 1	Counter-Enginewise	83	
WC-253-1	C 107A4RG5	X 8518	3.90 to 1	Counter-Enginewise	85	

NOTE: See twin disc illustration and parts price list for clutch reduction unit parts. Always give their specification, number shown on name plate, when ordering parts.

NOTE: Engines equipped with a clutch reduction unit require a special main bearing plate, crankshaft and crankcase as follows:

BG-194-1-S1 MAIN BEARING PLATE ASSEMBLY (not illustrated) consisting of:

1—BG-194-1 Bearing Plate 1—PH-278 Oil Seal

CA-59A-2-S1 CRANKSHAFT ASSEMBLY (not illustrated) for engines beginning with serial #771501 consisting of:

1—CA-59A-2 Crankshaft 1—PL-49 Key

1—GA-35A-1 Gear 1—RK-173 Oil Slinger

2—ME-98 Bearings

CA-59-2-S1 CRANKSHAFT ASSEMBLY for engines to and including serial #771500

THE PART NUMBER OF THE CRANKCASE CAN BE FOUND STAMPED ON THE TAKE-OFF END OF THE CRANKCASE ABOVE THE MAIN BEARING PLATE.

Order parts from nearest SERVICE STATION shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers shown on name plate.

WW-80 DRIVE HUB AND HOUSING ASSEMBLY
FOR TWIN DISC CLUTCH REDUCTION UNITS ON VM4 AND VP4 ENGINES

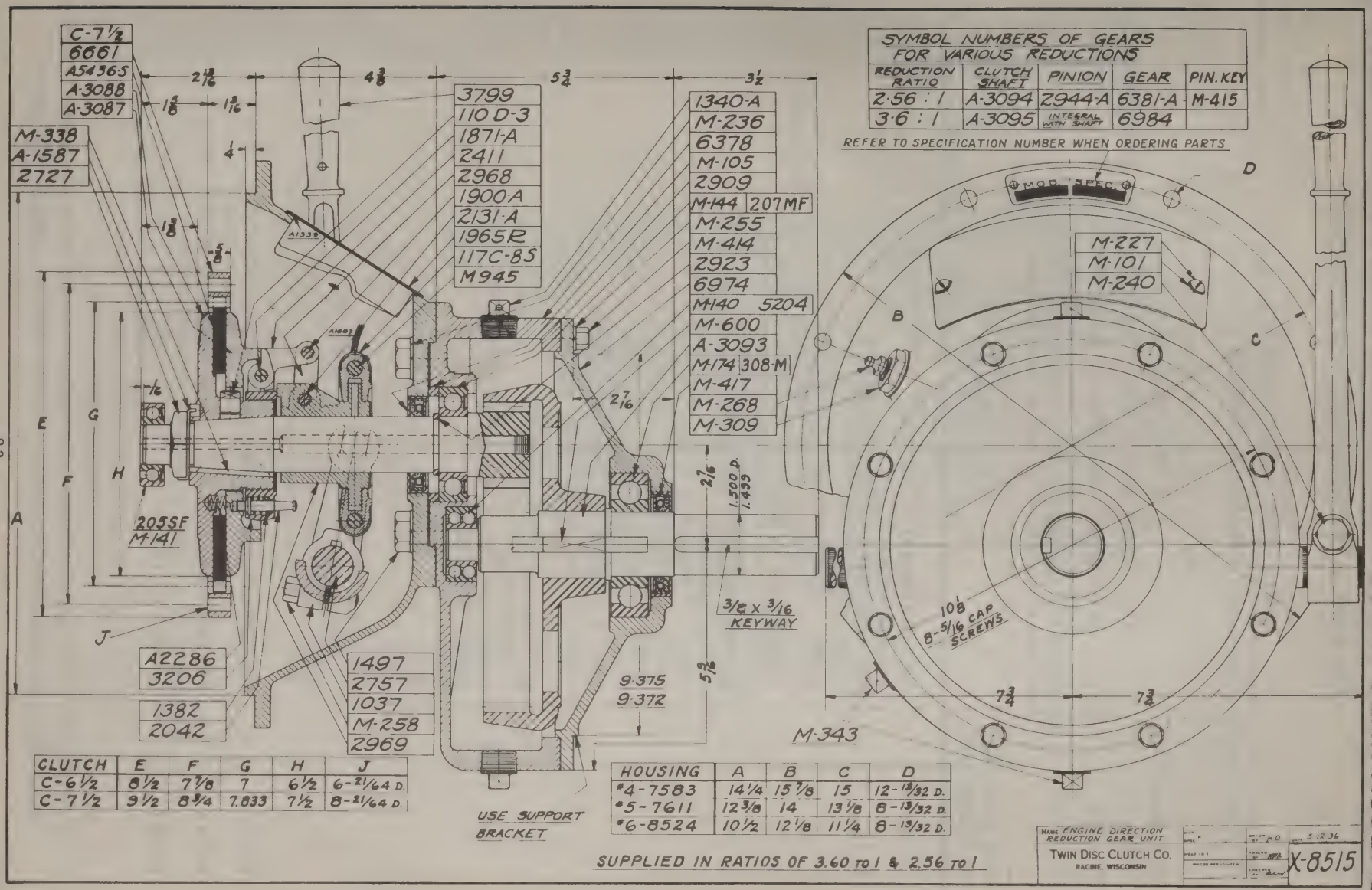
REF. NO.	PART NO.	DESCRIPTION	NO. REQ.	NET WEIGHT LBS.	NET WEIGHT OZ.
	WW-80	DRIVE HUB AND HOUSING ASSEMBLY..... Consisting of the following parts:			
600	BO-169-B-2	HOUSING—drive hub (#5 S.A.E.).....	1	29	8
601	NC-135A-1	DRIVE HUB.....	1	13	
602	PC-287	STUD—housing to crankcase mounting.....	4		2
603	PH-278	SEAL—main bearing (National Seal #55004).....	1		3
604	PH-279	RETAINER—drive hub.....	1		3
605	QD-668	CORK SEAL—drive hub key.....	1		1
606	SD-79-B	ASSEMBLY NUMBER TAG.....	1		1
607		Strom #205F pilot bearing..... (Furnished with clutch)	1		8
		STANDARD HARDWARE			
608	PD-145	NUT, 5/8"-18 thread, hexagon steel..... For mounting housing to crankcase.	4		1
609	PE-4	LOCKWASHER, 5/16" positive..... For mounting clutch to drive hub.	8		1
610	PE-5	LOCKWASHER, 3/8" positive..... For mounting unit to housing.	8		1

Order parts from nearest SERVICE STATION shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers shown on name plate.

WW-80 DRIVE HUB AND HOUSING ASSEMBLY
FOR TWIN DISC CLUTCH REDUCTION UNITS ON VM4 AND VP4 ENGINES

REF. NO.	PART NO.	DESCRIPTION	NO. REQ.	NET WEIGHT LBS.	NET WEIGHT OZ.
611	PE-37	LOCKWASHER, 5/8" positive For mounting housing to crankcase.	4		1
612	PE-50	LOCKWASHER, 1/16" countersunk For mounting hub retainer.	1		1
613	PL-122	KEY, #25 Woodruff For mounting drive hub.	1		1
614	XC-22	SCREW, 7/16"-14 thread x 1 1/4" long, flat head For mounting hub retainer.	1		1
615	XD-19	SCREW, 5/16"-18 thread x 1 1/4" long, hexagon head For mounting clutch to drive hub.	8		1
616	XD-27	SCREW, 3/8"-16 thread x 1" long, hexagon head For mounting unit to housing.	8		1

Order parts from nearest SERVICE STATION shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers shown on name plate.



SYMBOL NUMBERS OF GEARS FOR VARIOUS REDUCTIONS				
REDUCTION RATIO	CLUTCH SHAFT	PINION	GEAR	PIN. KEY
2.56 : 1	A-3094	2944-A	6381-A	M-415
3.6 : 1	A-3095	INTEGRAL WITH SHAFT	6984	

CLUTCH	E	F	G	H	J
C-6½	8½	7⅞	7	6½	6-21/64 D.
C-7½	9½	8¾	7.833	7½	8-21/64 D.

HOUSING	A	B	C	D
*4-7583	14¼	15⅞	15	12-13/32 D.
*5-7611	12⅜	14	13⅛	8-13/32 D.
*6-8524	10½	12⅛	11¼	8-13/32 D.

SUPPLIED IN RATIOS OF 3.60 TO 1 & 2.56 TO 1

NAME ENGINE DIRECTION REDUCTION GEAR UNIT
TWIN DISC CLUTCH CO.
RACINE, WISCONSIN
5-12-36
X-8515

WC-249-1 AND WC-250-1 CLUTCH REDUCTION GEAR ASSEMBLIES
FOR AM4, AP4, VM4 AND VP4 ENGINES

TWIN DISC CLUTCH COMPANY
RACINE, WISCONSIN

Repair Parts List for

Wis. Motor No.	Twin Disc No.
WC-249-1	X8515 Model C107E2.5RG5 Clutch Reduction Gear, Spec. 15356
WC-250-1	X8515 Model C107E3RG5 Clutch Reduction Gear, Spec. 15619

All parts are interchangeable on the above Twin Disc clutch reduction gears unless otherwise specified.

TWIN DISC PART NUMBER	NO. REQ.	DESCRIPTION
C-107	1	CLUTCH ASSEMBLY per Spec. 15270 (XA5060) Comprising:
H-18	1	HUB AND BACK PLATE ASSEMBLY Comprising: A3088 1 Hub and back plate Bore 1.375 - 1.374 tapered, 1/4 x 1/8 keyway 110D3 1 Plate pin
A-16	1	ADJUSTING YOKE ASSEMBLY Comprising: 3206 1 Adjusting yoke 2411 4 Fingers 1871A 4 Finger pins 2042 1 Adjusting lock pin 1382 1 Adjusting lock pin spring M642 4 Snap rings (5/16 x 1/2 x 3/64)
S-387	1	SLIDING SLEEVE ASSEMBLY Comprising: 2969 1 Sliding sleeve, Bore 1.381 - 1.379 2968 8 Lever links 2131A 4 Link pins M642 8 Snap rings (5/16 x 1/2 x 3/64) 1900A 4 Lever link pins 117C8S 1 CONE COLLAR ASSEMBLY Comprising: M945 2 Hexagon head capscrews (3/8-24 NF x 1-3/4) M645 2 Elastic stop nuts (3/8-24 NF x 29/64)
A5436S	1	DRIVING PLATE (3 segments)
A2286	6	RELEASE SPRING
A3087	1	FLOATING PLATE

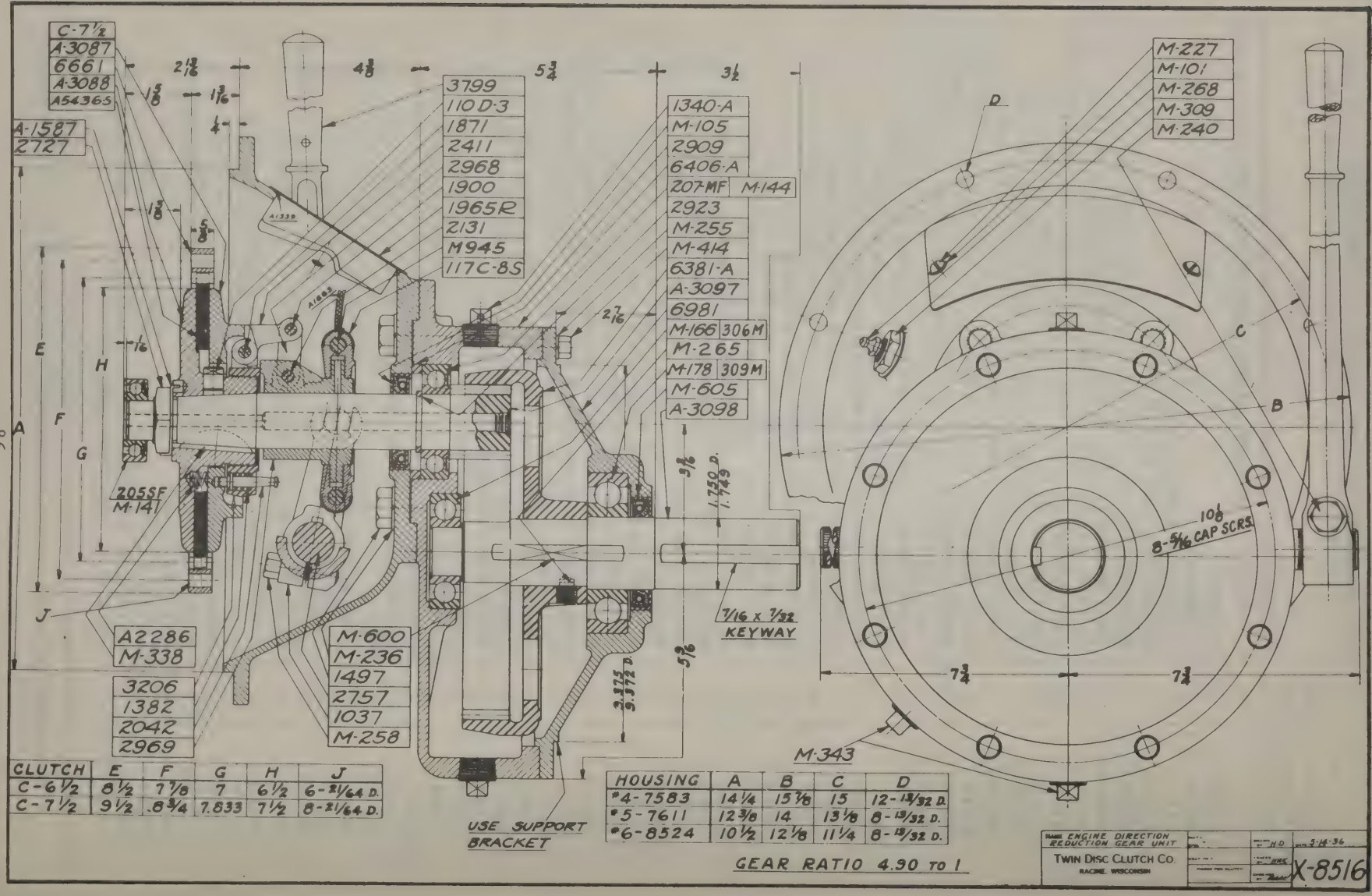
When ordering parts kindly advise the Twin Disc Specification Number.

WC-249-1 AND WC-250-1 CLUTCH REDUCTION GEAR ASSEMBLIES
FOR AM4, AP4, VM4 AND VP4 ENGINES

TWIN DISC PART NUMBER	NO. REQ.	DESCRIPTION
		MISCELLANEOUS CLUTCH AND REDUCTION UNIT PARTS
A1339	1	GASKET
A1587	1	LOCKWASHER
A1663	1	FLEXIBLE HOSE ASSEMBLY
A1664	1	SPECIFICATION PLATE
A3093	1	GEAR SHAFT
A3094	1	CLUTCH SHAFT (for WC-249-1 only) 2.56:1 reduction
A3095	1	CLUTCH SHAFT AND PINION (for WC-250-1 only) 3.6:1 reduction
M101	2	LOCKWASHERS (1/4 x 3/32 x 1/16)
M102	2	OIL CUP (1/4)
M105	1	OIL SEAL (NATIONAL 50055-2)
M140	1	BALL BEARING (MRC 5204)
M141	1	BALL BEARING (MRC 205-SF)
M144	1	BALL BEARING (MRC 207-MF)
M174	1	BALL BEARING (MRC 308-M)
M227	2	ROUND HEAD SCREW (1/4-20 NC x 1/2)
M236	5	INTERNAL LOCKWASHER (5/8 x 1-1/8 x 1/16)
M240	1	HEXAGON HEAD CAPSCREW (1/2-13 NC x 1-3/4)
M241	1	INTERNAL LOCKWASHER (1/2 x 59/64 x 1/16)
M255	8	INTERNAL LOCKWASHER (5/16 x 19/32 x 3/64)
M256	2	INTERNAL LOCKWASHER (3/8 x 3/4 x 3/64)
M258	2	HEXAGON HEAD CAPSCREW (3/8-16 NC x 1-1/2)
M265	1	HALF DOG POINT SET SCREW (1/2-13 NC x 5/8)
M268	1	MALE HYDRAULIC FITTING (1/8 N.P.T. x 11/16)
M291	2	WOODRUFF KEY (#15) 1/4 x 1
M309	1	LIGHT JAM NUT (5/8-18 NF x 3/8)
M338	1	WOODRUFF KEY (#27) 1/4 x 2-1/8
M343	2	SQUARE HEAD PIPE PLUG (1/2)
M414	8	HEXAGON HEAD CAPSCREW (5/16-18 NC x 7/8)
M415	1	STRAIGHT SQUARE KEY (5/16 x 5/16 x 1-1/8) on WC-249-1 only
M416	1	STRAIGHT SQUARE KEY (3/8 x 3/8 x 1-5/8) on WC-249-1 only
M417	1	OIL SEAL (NATIONAL 50185-2)
M422	2	DRIVE SCREW
M600	1	STRAIGHT SQUARE KEY (3/8 x 3/8 x 1-1/2) on WC-250-1 only
M1240	1	STRAIGHT SQUARE KEY (3/8 x 3/8 x 3-1/4)
1037	1	THROWOUT YOKE
1340A	1	PIPE PLUG
1497	4	CAPSCREW
1965R	1	INSTRUCTION COVER PLATE
2727	1	NUT
2757	1	OPERATING SHAFT
2909	1	SPACER
2923	1	SNAP RING
2943	1	SPACER (on WC-249-1 only)
2944A	1	PINION (on WC-249-1 only) 2.56:1 reduction
3799	1	HAND LEVER
6378	1	GEAR HOUSING
6381A	1	INTERNAL GEAR (on WC-249-1 only) 2.56:1 reduction
6661	1	DRIVING RING
6974	1	COVER PLATE
6984	1	INTERNAL GEAR (on WC-250-1 only) 3.6:1 reduction
7611	1	#5 S.A.E. CLUTCH HOUSING

When ordering parts kindly advise the Twin Disc Specification Number.

WC-251-1 CLUTCH REDUCTION GEAR ASSEMBLY



CLUTCH	E	F	G	H	J
C-6½	8½	7⅞	7	6½	6-21/64 D.
C-7½	9½	8¾	7.833	7½	8-21/64 D.

HOUSING	A	B	C	D
*4-7583	14¼	15⅜	15	12-13/32 D.
*5-7611	12⅜	14	13⅛	8-13/32 D.
*6-8524	10½	12⅛	11¼	8-13/32 D.

WC-251-1 CLUTCH REDUCTION GEAR ASSEMBLY
FOR AM4, AP4, VM4 AND VP4 ENGINES

TWIN DISC CLUTCH COMPANY
RACINE, WISCONSIN

Repair Parts List for

Wis. Motor No. — Twin Disc No.

WC-251-1 — X8516 Model C107E5RG5 Clutch Red. Gear, Specification 15759

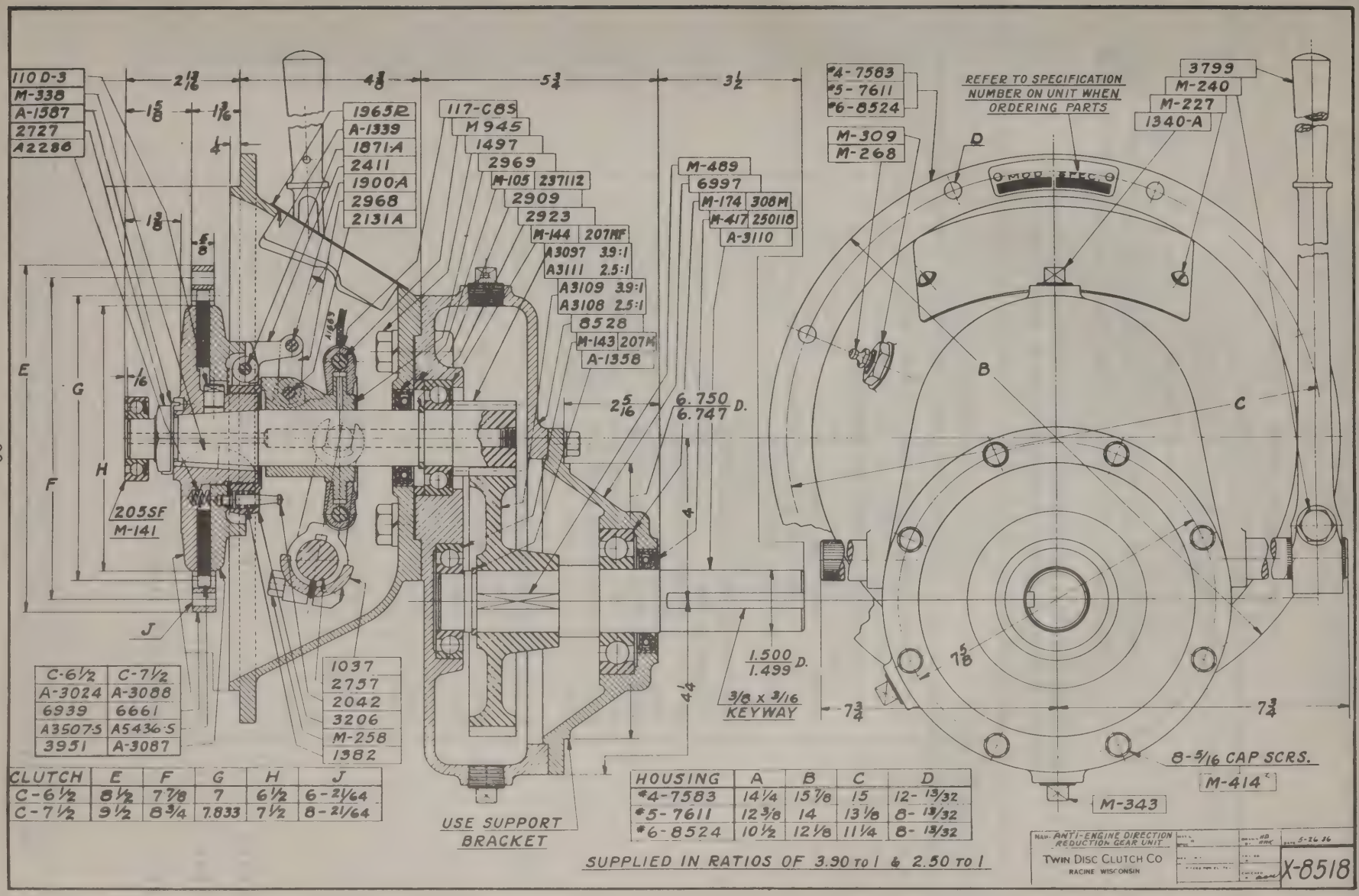
TWIN DISC PART NUMBER	NO. REQ.	DESCRIPTION
C-107	1	**CLUTCH ASSEMBLY** per Spec. 15270 (XA5060) Comprising:
H-18	1	**HUB AND BACK PLATE ASSEMBLY** Comprising: A3088 1 Hub and back plate Bore 1.375 - 1.374 tapered, 1/4 x 1/8 keyway 110D3 1 Plate pin
A-16	1	**ADJUSTING YOKE ASSEMBLY** Comprising: 3206 1 Adjusting yoke 2411 4 Fingers 1871A 4 Finger pins 2042 1 Adjusting lock pin 1382 1 Adjusting lock pin spring M642 4 Snap rings (5/16 x 1/2 x 3/64)
S-387	1	**SLIDING SLEEVE ASSEMBLY** Comprising: 2969 1 Sliding sleeve Bore 1.381 - 1.379 2968 8 Lever links 2131A 4 Link pins M642 8 Snap rings (5/16 x 1/2 x 3/64) 1900A 4 Lever link pins 117C8S 1 CONE COLLAR ASSEMBLY Comprising: M945 2 Hexagon head capscrews (3/8-24 NF x 1-3/4) M645 2 Elastic stop nuts (3/8-24 NF x 29/64)
A5436S	1	**DRIVING PLATE** (3 segments)
A2286	6	**RELEASE SPRING**
A3087	1	**FLOATING PLATE**

When ordering parts kindly advise the Twin Disc Specification Number.

WC-251-1 CLUTCH REDUCTION GEAR ASSEMBLY
FOR AM4, AP4, VM4 AND VP4 ENGINES

TWIN DISC PART NUMBER	NO. REQ.	DESCRIPTION
		MISCELLANEOUS CLUTCH AND REDUCTION UNIT PARTS
A1339	1	GASKET
A1587	1	LOCKWASHER
A1663	1	FLEXIBLE HOSE ASSEMBLY
A1664	1	SPECIFICATION PLATE
A3097	1	CLUTCH SHAFT AND PINION
A3098	1	GEAR SHAFT
M101	2	LOCKWASHERS (1/4 x 3/32 x 1/16)
M102	2	OIL CUP (1/4)
M105	1	OIL SEAL (NATIONAL 50055-2)
M141	1	BALL BEARING (MRC205-SF)
M144	1	BALL BEARING (MRC 207-MF)
M166	1	BALL BEARING (MRC 306-M)
M178	1	BALL BEARING (MRC 309-M)
M227	2	ROUND HEAD SCREW (1/4-20 NC x 1/2)
M236	5	INTERNAL LOCKWASHER (5/8 x 1-1/8 x 1/16)
M240	1	HEXAGON HEAD CAPSCREW (1/2-13 NC x 1-3/4)
M241	1	INTERNAL LOCKWASHER (1/2 x 59/64 x 1/16)
M255	8	INTERNAL LOCKWASHER (5/16 x 19/32 x 3/64)
M256	2	INTERNAL LOCKWASHER (3/8 x 3/4 x 3/64)
M258	2	HEXAGON HEAD CAPSCREWS (3/8-16 NC x 1-1/2)
M265	1	HALF DOG PT. SET SCREW (1/2-13 NC x 5/8)
M291	2	WOODRUFF KEY (#15) 1/4 x 1
M309	1	LIGHT JAM NUT (5/8-18 NF x 3/8)
M338	1	WOODRUFF KEY (#27) 1/4 x 2-1/8
M343	2	SQUARE HEAD PIPE PLUG (1/2)
M414	8	HEXAGON HEAD CAPSCREW (5/16-18 NC x 7/8)
M422	2	DRIVE SCREW
M600	1	STRAIGHT SQUARE KEY (3/8 x 3/8 x 1-1/2)
M605	1	OIL SEAL (NATIONAL 50183-2)
M1519	1	STRAIGHT SQUARE KEY (7/16 x 7/16 x 2-1/2)
1037	1	THROWOUT YOKE
1330	1	ALEMITE FITTING
1340A	1	PIPE PLUG
1497	4	CAPSCREWS
1965R	1	INSTRUCTION COVER PLATE
2727	1	HUB NUT
2757	1	OPERATING SHAFT
2909	1	SPACER
2923	1	SNAP RING
3799	1	HAND LEVER
6381A	1	INTERNAL GEAR
6406A	1	GEAR HOUSING
6661	1	DRIVING RING
6981	1	COVER PLATE
7611	1	#5 S.A.E. CLUTCH HOUSING

When ordering parts kindly advise the Twin Disc Specification Number.



CLUTCH	E	F	G	H	J
C-6½	8½	7⅞	7	6½	6-2/64
C-7½	9½	8¾	7.833	7½	8-21/64

HOUSING	A	B	C	D
*4-7583	14¼	15⅞	15	12-13/32
*5-7611	12⅜	14	13⅛	8-13/32
*6-8524	10½	12⅛	11¼	8-13/32

WC-252-1 AND WC-253-1 CLUTCH REDUCTION GEAR ASSEMBLIES
FOR AM4. AP4. VM4 AND VP4 ENGINES

TWIN DISC CLUTCH COMPANY
RACINE, WISCONSIN

Repair Parts List for

Wis. Motor No.	Twin Disc No.
WC-252-1	X8518 Model C107A2RG5 Clutch Reduction Gear, Spec. 15516
WC-253-1	X8518 Model C107A4RG5 Clutch Reduction Gear, Spec. 15748

All parts are interchangeable on the above Twin Disc clutch reduction gears unless otherwise specified.

TWIN DISC PART NUMBER	NO. REQ.	DESCRIPTION
C-107	1	CLUTCH ASSEMBLY per Spec. 15270 (XA5060) Comprising:
H-18	1	HUB AND BACK PLATE ASSEMBLY Comprising: A3088 1 Hub and back plate Bore 1.375 - 1.374 tapered, 1/4 x 1/8 keyway 110D3 1 Plate pin
A-16	1	ADJUSTING YOKE ASSEMBLY Comprising: 3206 1 Adjusting yoke 2411 4 Fingers 1871A 4 Finger pins 2042 1 Adjusting lock pin 1382 1 Adjusting lock pin spring M642 4 Snap rings (5/16 x 1/2 x 3/64)
S-387	1	SLIDING SLEEVE ASSEMBLY Comprising: 2969 1 Sliding sleeve, Bore 1.381 - 1.379 2968 8 Lever links 2131A 4 Link pins M642 8 Snap rings (5/16 x 1/2 x 3/64) 1900A 4 Lever link pins 117C8S 1 CONE COLLAR ASSEMBLY Comprising: M945 2 Hexagon head capscrews (3/8-24 NF x 1-3/4) M645 2 Elastic stop nuts (3/8-24 NF x 29/64)
A5436S	1	DRIVING PLATE (3 segments)
A2286	6	RELEASE SPRING
A3087	1	FLOATING PLATE

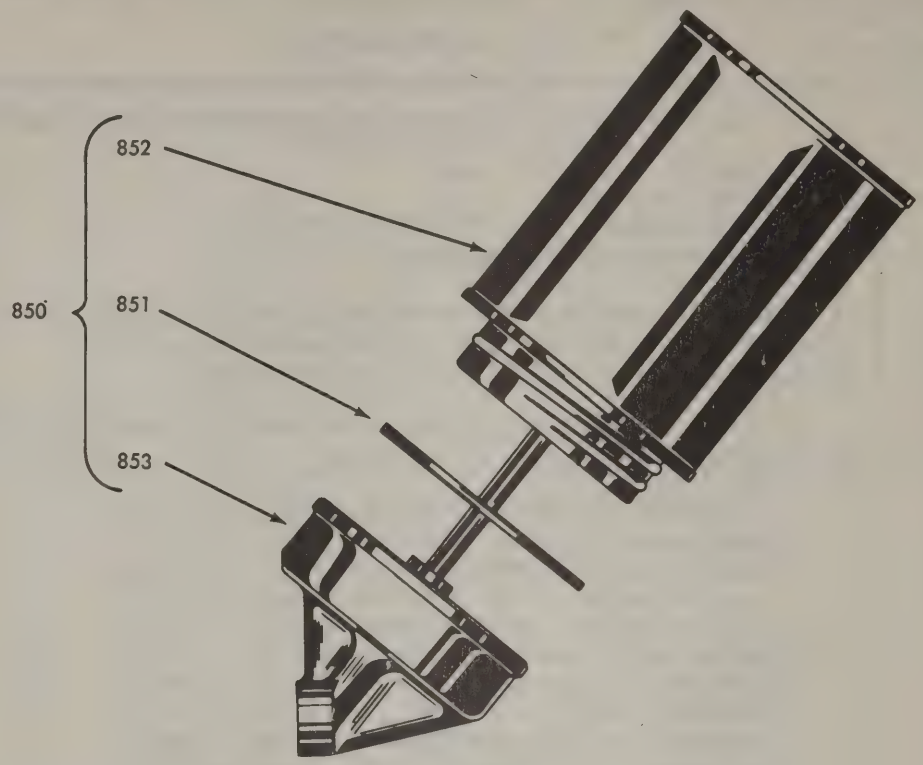
When ordering parts kindly advise the Twin Disc Specification Number.

WC-252-1 AND WC-253-1 CLUTCH REDUCTION GEAR ASSEMBLIES
FOR AM4, AP4, VM4 AND VP4 ENGINES

TWIN DISC PART NUMBER	NO. REQ.	DESCRIPTION
		MISCELLANEOUS CLUTCH AND REDUCTION UNIT PARTS
A1339	1	GASKET
A1358	1	CONE STOP RING
A1587	1	LOCKWASHER
A1663	1	FLEXIBLE HOSE ASSEMBLY
A1664	1	SPECIFICATION PLATE
A3097	1	CLUTCH SHAFT AND PINION (for WC-253-1 only) 3.9:1 reduction
A3108	1	GEAR (for WC-252-1 only) 2.5:1 reduction
A3109	1	GEAR (for WC-253-1 only) 3.9:1 reduction
A3110	1	GEAR SHAFT
A3111	1	CLUTCH SHAFT AND PINION (for WC-252-1 only) 2.5:1 reduction
M101	2	LOCKWASHER (1/4 x 3/32 x 1/16)
M102	2	OIL CUP (1/4)
M105	1	OIL SEAL (NATIONAL 50055-2)
M141	1	BALL BEARING (MRC 205-SF)
M143	1	BALL BEARING (MRC 207-M)
M144	1	BALL BEARING (MRC 207-MF)
M174	1	BALL BEARING (MRC 308-M)
M227	2	ROUND HEAD SCREW (1/4-20 NC x 1/2)
M236	5	INTERNAL LOCKWASHER (5/8 x 1-1/8 x 1/16)
M240	1	HEXAGON HEAD CAPSCREW (1/2-13 NC x 1-3/4)
M241	1	INTERNAL LOCKWASHER (1/2 x 59/64 x 1/16)
M255	8	INTERNAL LOCKWASHER (5/16 x 19/32 x 3/64)
M256	2	INTERNAL LOCKWASHER (3/8 x 3/4 x 3/64)
M258	2	HEXAGON HEAD CAPSCREW (3/8-16 NC x 1-1/2)
M268	1	MALE HYDRAULIC FITTING (1/8 N.P.T. x 11/16)
M291	2	WOODRUFF KEY (#15) 1/4 x 1
M309	1	LIGHT JAM NUT (5/8-18 NF x 3/8)
M338	1	WOODRUFF KEY (#27) 1/4 x 2-1/8
M343	2	SQUARE HEAD PIPE PLUG (1/2)
M414	8	HEXAGON HEAD CAPSCREW (5/16-18 NC x 7/8)
M417	1	OIL SEAL (NATIONAL 50185-2)
M422	2	DRIVE SCREWS
M489	1	STRAIGHT SQUARE KEY (3/8 x 3/8 x 2)
M586	1	STRAIGHT SQUARE KEY (3/8 x 3/8 x 2-1/2)
1037	1	THROWOUT YOKE
1340A	1	PIPE PLUG
1497	4	CAPSCREWS
1965R	1	INSTRUCTION COVER PLATE
2727	1	NUT
2757	1	OPERATING SHAFT
2909	1	SPACER
2923	1	SNAP RING
3799	1	HAND LEVER
6661	1	DRIVING RING
6997	1	COVER PLATE
7611	1	#5 S.A.E. CLUTCH HOUSING
8528	1	GEAR HOUSING

When ordering parts kindly advise the Twin Disc Specification Number.

OIL FILTER
FOR VE4, VF4, VM4 and VP4 ENGINES



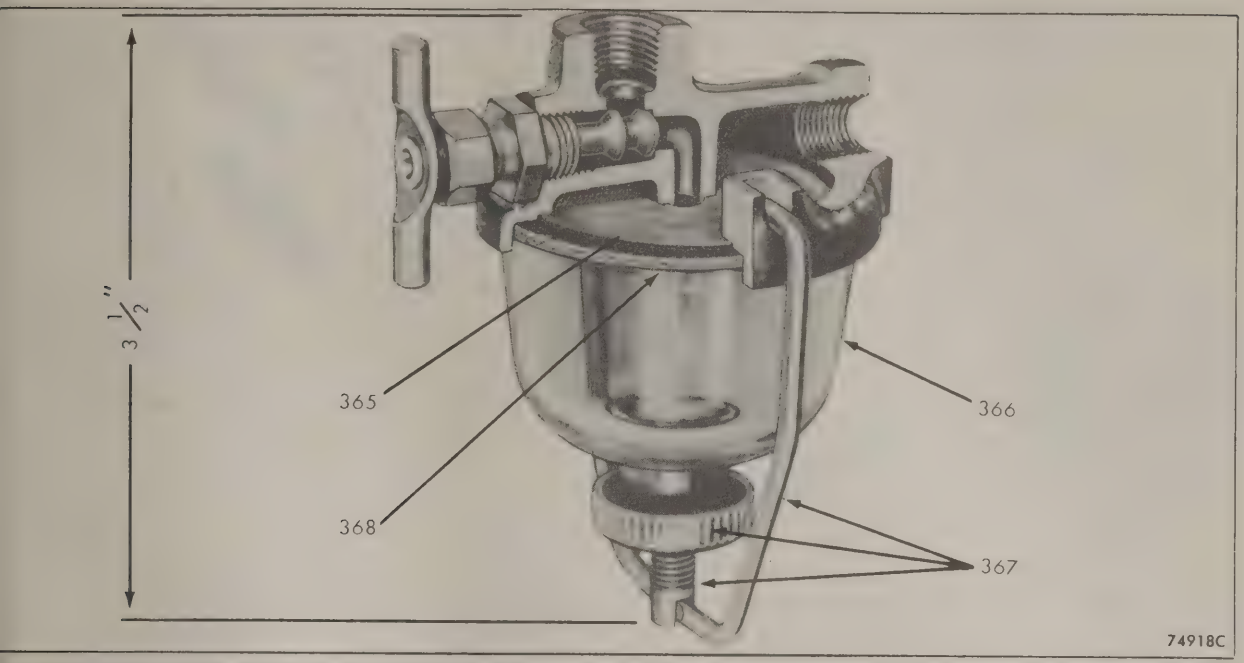
MICHIANA PRODUCTS CORPORATION NO. 18200
WIX ACCESSORIES CORPORATION NO. WF-14-W
WISCONSIN MOTOR CORPORATION NO. RV-27-A

The above Michiana and Wix Oil Filters are interchangeable as a unit and in parts.

REF. NO.	MICHIANA PART NO.	WIX PART NO.	DESCRIPTION	NO. REQ.	NET WEIGHT LBS.	NET WEIGHT OZ.
850	**18200**	**WF-14-W**	**OIL FILTER COMPLETE**	**1**	**1**	**13**
851	**18404**	**G-76**	**GASKET**	**1**		**1**
852	**SA-18667**	**CW-104-M**	**FILTER ELEMENT**	**1**		**7**
853	**SA-18201**	**CB-14-W**	**BASE CASTING WITH CENTER TUBE AND RESTRICTION**	**1**	**1**	**6**

Order parts from nearest SERVICE STATION shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers shown on name plate.

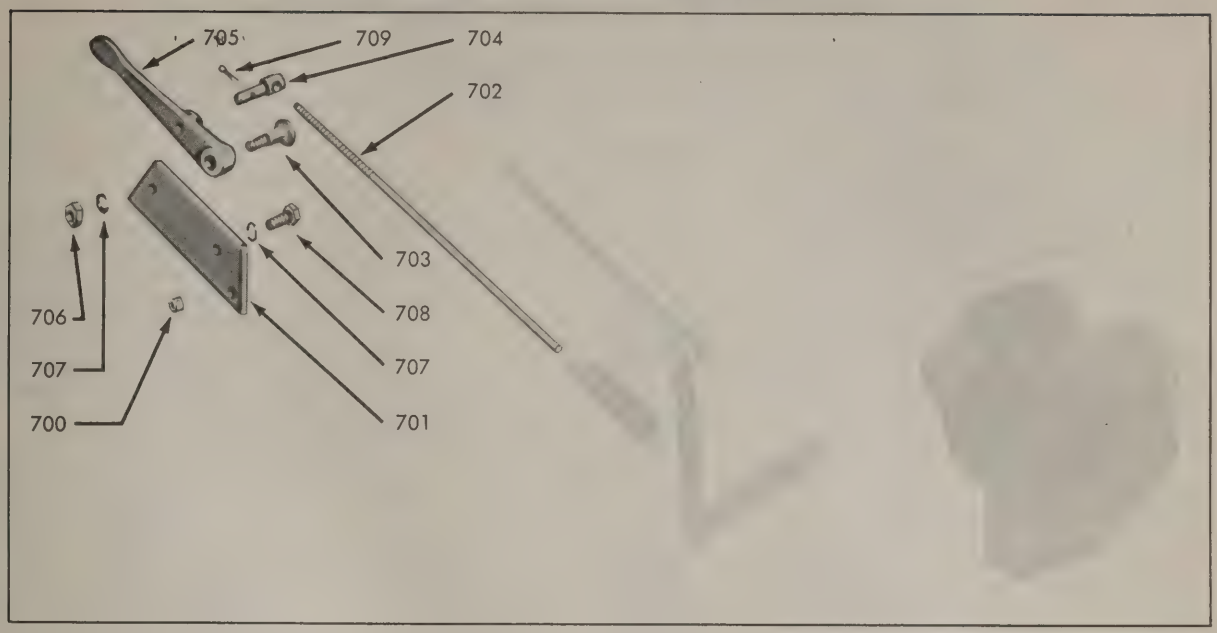
LP-19, LP-19-A, LP-19-B AND LP-19-C FUEL STRAINER ASSEMBLIES



REF. NO.	PART NO.	DESCRIPTION	NO REQ.	NET WEIGHT LBS.	NET WEIGHT OZ.
	LP-19	**FUEL STRAINER ASSEMBLY** (With Shut-off valve in cover and glass bowl) Tillotson #**OW-418-T**	1		8
	LP-19-A	**FUEL STRAINER ASSEMBLY** (With Shut-off valve in cover and metal bowl) Tillotson #**OW-449-T**	1		7
	LP-19-B	**FUEL STRAINER ASSEMBLY** (Without Shut-off valve in cover with glass bowl) Tillotson #**OW-444**	1		6
	LP-19-C	**FUEL STRAINER ASSEMBLY** (Without Shut-off valve in cover, with metal bowl) Tillotson #**OW-476-T**	1		5
		THE FOLLOWING SERVICEABLE PARTS ARE INTERCHANGEABLE FOR ALL THE ABOVE FUEL STRAINERS.			
365	OW-352	**FILTER SCREEN**	1		1
366	OW-363	**GLASS BOWL**	1		2
	06137	**METAL BOWL**	1		1
367	OW-447	**CLAMP WIRE AND THUMB NUT ASSEMBLY**	1		1
368	06096	**BOWL GASKET** (Wisconsin #**QD-653**)	1		5

Order parts from nearest SERVICE STATION shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers shown on name plate.

TT-61-D IDLE CONTROL ASSEMBLY
FOR VM4 AND VP4 ENGINES



135518C

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT LBS	NET WEIGHT OZ.
700	HF-417	SPACER for control lever bracket.	1		1
701	PG-466	BRACKET for control lever.	1		2
702	PI-147-A	ADJUSTING SCREW	1		2
703	TC-380	FULCRUM PIN for control lever.	1		1
704	TC-381	PIN for adjusting screw.	1		1
705	VB-142	IDLE CONTROL LEVER	1		4
		STANDARD HARDWARE			
706	PD-77	NUT, 1/4"-20 thread, hexagon steel. For fulcrum pin.	1		1
707	PE-3	LOCKWASHER, 1/4" Positive. 1-for fulcrum pin. 1-for bracket mounting.	2		1
708	XD-6	SCREW, 1/4"-20 thread x 3/4" long, hexagon head. For bracket mounting.	1		1
709	XI-1	COTTER PIN, 1/16" x 1/2" long. For adjusting screw pin.	1		1

Order parts from nearest *SERVICE STATION* shown in directory following parts list.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

WISCONSIN MOTOR CORPORATION
APPROVED SERVICE STATIONS

The following concerns have service part stocks, facilities and trained personnel to render complete service on Wisconsin Air-Cooled Engines. We recommend you work through these service stations on your Wisconsin engine service requirements.

* DISTRIBUTORS

ALABAMA

ABBEVILLE	Abbeville Tractor & Implement Company
ALBERTVILLE	Birdsong Farm Supplies
ALICEVILLE	Kimbrell Tractor & Implement Company
ANDALUSIA	Count Darling, Inc.
ATHENS	Charles W. Spencer
ATMORE	Watson Hardware Company
BAYOU LA BATRE	Zewen Marine Service
BIRMINGHAM	Gerkin-Leaptrot Sales, Inc.
	Kilgore-McRee Company, 4612 Avenue V
	Tractor & Equipment Co., 4401 First Ave. N.
BREWTON	Watson Hardware Company
CALERA	Bowden Auto & Implement Company
CLANTON	Oglesby-Orr, Inc.
CLAYTON	Beaty Motor Company
CULLMAN	Morris Tractor & Implement Company
DECATUR	J. D. Pittman Impl. Co., Inc., Lee & Line Sts.
DOTHAN	Dean Mfg. Company
	A. E. Ludlum
	Whaley Trading Company, South East Street
ENTERPRISE	Bryson Implement & Truck Company
EUFAULA	Manley Motor & Implement Company
FAYETTE	Kimbrell Tractor & Implement Company
FLOMATON	Watson Hardware Company
FLORENCE	Rice & England
FOLEY	Foley Hardware Company
GADSDEN	Alabama Farm Supply Co., 230 S. 2nd Street
GENEVA	Andrews Truck & Tractor Company
GREENVILLE	Burch & Byars Tractor Company
GURLEY	Phillips Motor Company
HARTSELLE	Groover Tractor & Implement Company
HEADLAND	Walden Motor Company
HUNTSVILLE	Farm Tractor Company
JASPER	Jasper Machinery & Foundry Works
LUVERNE	Luverne Implement Company
MOBILE	Gravely Mobile Authorized Sales & Service
	2014 Halls Mill Road
	Turner Supply Company
MONTGOMERY	* Parts Service Corporation, 408 Bibb Street
	Leary & Owens Machinery Co., 324 N. Perry St.
MOULTON	A. H. Turner
OPELIKA	Opelika Truck & Tractor Company
OPP	Farmers Equipment Company
OXFORD	Jones Tractor Company
PHENIX CITY	The Mullins Company
RUSSELLVILLE	Felton Hardware & Implement Company
SAMSON	T. J. Brooks & Son
SELMA	Henderson & Allen Implement Company
	Selma Parts Service
TUSCALOOSA	Cain Machine Shop, 1504 Queen Avenue
	Cochrane Tractor Company, 404 Greensboro Ave.

ARIZONA

COTTONWOOD	Smelter City Iron Works
DOUGLAS	Arizona Tire & Supply Co., 1065 F Avenue
	VanDemark Equipment Company
FLAGSTAFF	Hubbard Refrigeration Service, 105 W. Aspen Ave.
HOLBROOK	Bentley Pump & Supply Company
KINGMAN	Arthur's Sales & Service
MESA	Lyle H. Trimble, Inc.
NOGALES	Louis Arboisiere, 312 Noon Street
PHOENIX	* Pratt-Gilbert Hardware Co., P.O. Box 2230
	Eager Equipment Co., 3608 Grand Avenue
	Guerin Implement Co., 1403 S. Central Avenue
	Maricopa Tractor & Equipment Company
	State Tractor & Equipment Company
	Tovrea Equipment Company, P.O. Box 471
PIMA	Leo Cluff, Pima Garage
PRESCOTT	Arizona Mining Supply Corp.
SELIGMAN	Seligman Garage
SPRINGERVILLE	Bud Fink
TUCSON	Frank J. Smith, 146 S. 6th Avenue
WILLIAMS	K. N. Richardson
WINSLOW	Winslow Auto Supply Company
YUMA	Hartnett & Braden Tractor Company

ARKANSAS

ARKADELPHIA	Ashby Bros.
AUGUSTA	E. H. Connors Mercantile Company
BATESVILLE	Barnett & Landers
BERRYVILLE	Earl Hailey Mercantile Company
BLYTHEVILLE	Sixty One Implement Company
BRINKLEY	Brinkley Farm Equipment Company
CALICO ROCK	Brummitt & Kerr
CARLISLE	Birdsong Motor Company
CORNING	Corning Implement Company
COTTON PLANT	The Leader Company
ENGLAND	Wood Machinery Company
FAYETTEVILLE	Andrews Implement Company
FISHER	Wilson Bros. Equipment Company
FOREMAN	Delta Supply Company
FORREST CITY	Shearin Implement Company
FORT SMITH	Powers Brothers
HARRISBURG	Tarrant Machine Company
HARRISON	Watkins Buick & Equipment Company
JOINER	Bowden Equipment Company
JONESBORO	Bridger Supply Company
LAKE VILLAGE	Spiver Implement Company
LEACHVILLE	W. I. Field Implement Company
LITTLE ROCK	* Lewis-Diesel Engine Company
	4121 Asher Avenue
	Lyons Machinery Company
LONOKE	J. D. Wood Implement Company
MALVERN	Malvern Supply & Equipment Company
MARIANNA	W. S. McClintock & Sons
MARKED TREE	Marked Tree Implement Company
McCRORY	M. D. Thompson & Son
MORRILLTON	Love Supply Company
NASHVILLE	Nashville Distributing Company
NEWARK	C. C. Norris & Sons
NEWPORT	W. P. Davis
N. LITTLE ROCK	Standard Equipment & Supply Company
OSCEOLA	Missco Implement & Hardware Company
PARAGOULD	Green Implement Company
PINE BLUFF	Lewis Engine & Supply Company
POCAHONTAS	Sallee Implement Company
PRESCOTT	Prescott Implement Company
RECTOR	Hurst Equipment Company
ROGERS	Huenefeld Implement Company
SEARCY	Abboud Tractor Company
STUTTGART	Waggoner & Wortman Service Company
TEXARKANA	Texarkana Machinery Company
WALDENBURG	W. K. Neeley
WYNNE	Rolfe Implement Company

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CALIFORNIA

ALHAMBRA	Ja R Engine & Supply, 1819 W. Valley Blvd.
ALTURAS	Farmers Exchange
ARCATA	Brizard-Matthews Machy. Company
ARVIN	Mitchells
BAKERSFIELD	Janco Pump & Engine Co., 2309 Chester Avenue
BISHOP	Black's Machine Shop. 203 E. Willow
BLYTHE	Beeler-Thomas Implement Company
CHICO	Butte Pump & Motor Works 9th St. & Oroville
	Sierra Tractor & Equipment Co., 1240 Park Ave.
COLUSA	I. G. Zumwalt Company
CONCORD	Concord Farm Impl. Co., 2086 Concord Avenue
CORCORAN	Cole Tractor & Equipment Co., Whitley Avenue
	Sawtelle & Rosprim
DELANO	Central California Implement Co., 918 Main St.
EL CENTRO	Valley Auto Supply Co., 633 State Street
EL MONTE	El Monte Scooter Sales, 11501 E. Garvey
EMERYVILLE	* E. E. Richter & Son, 5725 Hollis Street
ESCONDIDO	Webb Bros., 252 W. Grand Avenue
EUREKA	Kramer Auto Supply Company, 4th & "C" Streets
FERNDALE	Olsen Implement Company
FORT DICK	Presley D. Tryon
FRESNO	Hoeffler Mchry. & Tools, 2192 Railroad Avenue
	A. P. Lish, 1427 Broadway
	Peerless Pump Div. Food Mchry. Corp. 1755 Broadway
	Peerless Tractor & Equipment Co., 1776 "H" St.
GILROY	G. A. Chappell & Sons
	Farm Supply Company, 60 N. Monterey Street
GLENDORA	Foothill Supply Company, P. O. Box 218
GUSTINE	Azevedo & Company
HALF MOON BAY	Peterson Tractor & Equipment Company
HANFORD	Hanford Farm Supply Co., 309 E. 7th Street
HAYWARD	Arthur C. Day Impl. Co., 645 Watkins Street
	Peterson Tractor & Equipment Co., 685 "A" St.
HEALDSBURG	Lenard's Repair Service, 438 West Street
	Steve's Auto Parts, 1205 E. Florida
INDIO	James E. Wright, Jr., 48th & Van Buren
KING CITY	Barry R. Scott, 428 Broadway
LANCASTER	Johnson & Schaffert, Ave. I at 10th Street
LODI	Thompson-Sage, Inc., 126 S. Main Street
LOMPOC	Lompoc Equipment Company
LONG BEACH	Curtis & Christensen, 501 E. Anaheim
LOS ANGELES 11	* Continental Sales & Service Company 3817 South Santa Fe Avenue
	Harvel Truck Equipment Co., 1000 E. 8th St.
	Oliphant Bros., 2625 S. LaCienega Blvd.
LOS BANOS	Anderson Seed & Feed Co., 931 "L" Street
LYNWOOD	Franklin Auto Supply Co., 4339 Imperial Highway
MADERA	Thompson & Gill, Inc., South Pine Street
MARYSVILLE	Hust Bros., 3rd & "E" Streets
	The Oliver Equipment Co., 2nd & "B" Streets
MERCED	Shannon Tractor & Pump Co., 345 - 16th Street
MODESTO	Stanislaus Impl. & Hardware Company 10th & "F" Streets
MONROVIA	Vitale Concrete & Equipment Company 926 S. Primrose
MOUNTAIN VIEW	B & H Equipment Co., 2145 El Camino Real
MURRIETA	Murrieta Machine Shop
NAPA	Bert Williams & Son, 831 First Street
NEWPORT BEACH	Power Generator Plants, 634 Coast Highway
NORTH HOLLYWOOD	Johnson Equipment Co., 6900 Lankershim Blvd.
OAKLAND	Bay Cities Equipment Co., 2792 Cypress Street
	Ricker Machinery Company, 302 - 4th Street
ONTARIO	Prehn's, Holt at Ramona
ORO GRANDE	Oro Grande Implement Company
OXNARD	Maulhardt Equipment Co., 815 N. Oxnard Blvd.
PASO ROBLES	H. A. Wood Welding & Machine Shop 1207 - 13th Street
PORTERVILLE	Porterville Farm Implement Co., 428 S. Main St.
RED BLUFF	Minch Farm Implement Store
REDDING	Gerlinger Steel & Supply Co., 1527 Sacramento
	Sierra Tractor & Equipment Company
REEDLEY	Grower's Supply Company
RIVERSIDE	Coates & Son, 263 LaCadena
SACRAMENTO	Beeby Machinery Company, 2000 Capitol Ave.
	Munz Bros., 301 N. 12th Street
N. SACRAMENTO	Sacramento Pump & Supply House 1711 Del Paso Boulevard
SALINAS	Cornell Tractor Company, 10 Abbott Street
	Farmer's Mercantile Company
	Pringle Tractor Company, 10 Abbott Street
	Ray's Equipment Rentals, 1040 E. Baseline
SAN FRANCISCO	Edward R. Bacon, 17th & Folsom Street
	Bay Cities Equipment Co., 250 - 7th Street
	Geo. C. Boardman Co., 122 Battery Street
	H. V. Carter Co., Inc., 52 Beale
	Coast Equipment Company, 948 Bryant Street
	Kerr Equipment Company, 160 - 10th Street
	Pacific Pumping Company, 954 Howard Street
	Peterson Tractor & Equipment Company 923 Harrison Street
SAN DIEGO	Depew Boat Mart, 1800 Rosecrans
	Webb Bros., 940 "K" Street
SAN JOSE	Hanford Eldh, 490 Emory Street
	Kronk Machine & Mfg. Co., 566 W. Julian Street
	Valley Equipment Company, 1178 W. San Carlos
SAN LORENZO	Faria Brothers
SAN LUIS OBISPO	Fred H. Johnson, 1119 Garden Street
SANTA ANA	James Requarth, 111 Spurgeon Street
SANTA BARBARA	Howard P. Miller, 29 State Street
	Milpas Rental Service, 6 N. Milpas Street
SANTA ROSA	Crown Parts & Machine Works 435 Mendocino Avenue
	Stevenson Farm Equip. Co., 104 Main Street
SOUTH DOS PALOS	Yonkers & Johnson
STOCKTON	Garvey Truck Service, 420 N. Wilson Way
	Marine Industrial Supply Co., 5 East Miner Ave.
	Thompson-Sage, Inc, 400 Wilson Way
TRACY	Thompson-Sage, Inc., 208 E. 11th Street
	W & P Sales Co., South Highway 50
TULARE	Central California Implement Company 320 E. Tulare Street
TULE LAKE	Floyd A. Boyd Company
UKIAH	Cowan Equipment Company, 949 State Street
	Holz Company, Clay at Railroad
VAN NUYS	So-Cal Equipment & Supply, 7227 Van Nuys Blvd.
VISALIA	Charles J. Hammer Mchy. Co., 915 E. Main
WATSONVILLE	Farmers' Mercantile Co., Wall & Van Ness
WEST LOS ANGELES	Sam's U-Drive, 2431 S. Sepulveda
	Whittier Motor Parts, 306 S. Greenleaf
WILMINGTON	Johnson Specialty Company, 804 E. Anaheim
WILLOWS	I. G. Zumwalt Company
YREKA	Floyd A. Boyd Company
YUBA CITY	Schmidt Pump House & Machine Shop

COLORADO

BRUSH	Farmer's Elevator Company
BURLINGTON	McArthur Impl. Company
CENTER	Hurt Equipment Company
CHEYENNE WELLS	Korrell Farm Equipment Company
COLORADO SPRINGS	Farmer's Impl. Company
DELTA	Delta Farm Supply
	Ray Fiegel Trading Post
DENVER	* Central Supply Co., 12th & Lincoln
	Engine Supply Company, 1862 Lawrence
	McCarty-Sherman, 275 Mariposa
	Parker Company, 1520 Wazee
DURANGO	Basin Truck & Implement
FLAGLER	Blancken Impl. Company
FORT COLLINS	Stansbury-Ghent Farm Equipment
FORT MORGAN	Morgan County Impl. Company

GRAND JUNCTION	Dunn & Knight Appliance Company
	Ray Fiegel Trading Post
GREELEY	Rainforth Equipment Company
LAMAR	Motor Supply
LIMON	Quist-Holmes
PUEBLO	Bernstein Bros. Pipe & Mchy.
	Pueblo Shapening Service
STERLING	Northeastern Equipment Company
TRINIDAD	Barney's Garage
WRAY	Lewis O. Wages Impl. Company

CONNECTICUT

BRIDGEPORT	The Arnold Company
HARTFORD	McCallum Motor Service
MERIDEN	Meriden Equipment Co., 229 Camp Street
NEW HAVEN	W. I. Clark Company
NEW MILFORD	New Milford Tractor
TORRINGTON	Knight's Farm Machinery
WATERBURY	Contractors Supply Company, Inc.
	15 East Aurora Street
WILLIAMANTIC	Wright's Garage, Star Route
WINDSOR LOCKS/	The F. S. Bidwell Company
	* John Reiner & Company
	12-12 37th Avenue
	Long Island City, New York

DELAWARE

BRIDGEVILLE	O. A. Newton & Son
MILFORD	Taylor Auto Supply Company
WILMINGTON	Taylor Auto Supply Company
	12th & French Street
	* Service Supply Corporation
	20th & Venango Streets
	Philadelphia, Pennsylvania

DISTRICT of COLUMBIA

WASHINGTON, D.C.	/Dawson Motor Co., 900 Maine Street
	Frank Del Vecchio & Son, 1212 - 11th Street
	* Phillips Machinery & Tractor Company
	P. O. Box 549
	Alexandria, Virginia

FLORIDA

APALACHICOLA	Wefing's
ARCADIA	Bishop Rotary Mower
AVON PARK	Ed. Gough
BLOUNTSTOWN	W. F. Mason
BOCA GRANDE	Electric Service Company
BOWLING GREEN	Nicholson Supply Company
BRADENTON	Ivey Auto Parts
BRANFORD	Geo. W. Fletcher Company
CANTONEMENT	Cantonement Service Station
CARRABELLE	Gulf Supply Company
CEDAR KEYS	Ice & Storage, Inc.
CHIEFLAND	Beauchamp Hardware Company
CLEARMONT	Grove Service & Supply Company
CLEWISTON	Ross LaByer's One Stop Service Station
COCOA	Brevard Marine Sales & Service, City Dock
CROSS CITY	C. E. Glenn
CRYSTAL RIVER	Packer Motor Company
DADE CITY	Equipment Sales & Service Company
DeFUNIAK SPRINGS	City Tractor & Implement Company
EVERGLADES	Riggs Fish Company
FERNANDINA	Standard Hardware Company
FLORENCE VILLA	Growers Service Company
FORT MYERS	Ed. Boyette Air-Cooled Motor Service
	Fort Myers Iron Works
	Jepson Tractor Company
	Weldrite Welding Company
FORT PIERCE	Turner Machine & Supply Company
FROSTPROOF	Maxcy's Garage
GAINESVILLE	Dixie Equipment Company
GREENSBORO	Fletcher Company
GREENVILLE	Brown Motor Sales
HASTINGS	Farmer's Supply Company
HAVANA	Havana Equipment Company
	Shelfnor & Ellinor
INALOKEE	Hill York Company
JACKSONVILLE	* M. D. Moody
	Brooks Marine
JENSEN BEACH	Sea Horse Tackle Company
KISSIMMEE	Smith & Daniels
LAKE BUTLER	East End Service Station
LAKELAND	Polk Machine Works
	Reliable Machine Works
LAKE PLACID	Standard Garate & Machine Shop
LAKE WALES	J. R. Edenfield
	Reliable Machine Works
LARGO	Largo Small Engine
LEESBURG	Nelson Marine Mart, 223 So. 6th Street
LIVE OAK	Ottis Brown Tractor Company
LONGWOOD	Courtney Engineering Company
MADISON	Waring Wyche Hardware Company
MARIANA	* West Florida Equipment Company
MELBOURNE	Wolcott, Industries
MIAMI	* Neff-Thomas Machinery, Inc.
	1920 N. W. Miami Court
	Llewellyn Machinery Company
MIMS	Taylor Brothers
NOCATEE	Bassler's Garage
OCALA	Link Brothers
OKEECHOBEE	Domer Machine Shop
ORLANDO	* Highway Equipment Service
OVIEDO	Hunts Garage
PAHOKEE	Palm Service Company
PALATKA	Beasley Tractor Company
PALMETTO	Palmetto Pump Company
PANAMA CITY	Hurston Motor Company
PENSACOLA	West Florida Truck & Tractor Co., 675 S. O St.
	D. M. Witherill Company, 713 S. Palifox Street
PERRY	Perry Auto Supply Company
PIERSON	Wells Supply Company
PLANT CITY	J. S. Carter Pump Company
PORT ST. JOE	M. G. Lewis & Son
PUNTA GORDA	Cerny's Machine Shop
QUINCY	Suber & Johnson
ST. AUGUSTINE	Richardson Machine Company
ST. CLOUD	Western Auto Supply Company
ST. PETERSBURG	J. W. Appley & Son, Inc., 831 - 9th Street, N.
SAMOSET	Manatee Mfg. Company
SEBRING	Pounds Zeiss Tractor Company
	Radebaugh & Sons
STUART	Ulmer Motors
TALLAHASSEE	Seabrook Truck & Tractor Company
	Terry-Rosa Hardware Company
TAMPA	* Industrial Supply Corporation, 1800 2nd Ave.
	Barney's Outboard Motors, 103 Jackson Street
	Hillsboro Pump & Irri. Co., 960 Twiggs Street
	Machinery Service Company, Box 5067
TARPON SPRINGS	Leist Engineering Company
TITUSVILLE	Central Garage
TRENTON	Lee Roberts Motors
VERO BEACH	Marvins Garage, Occeola and Commercial
WAUCHULA	Shag Taylor Pump Company
WEBSTER	John W. Barber, Jr.
WEST PALM BEACH	J. P. Carrol Company
	Coastal Truck & Equipment Company
WILLIAMS POINT	Williams Garage
WINTER GARDEN	M and M Welding Company
WINTER HAVEN	Lake Ida Welding
YANKEETOWN	Yankeetown Garage

GEORGIA

ADEL	Adel Trading Company
ALBANY	* R. S. Armstrong & Bro. Co. of Albany 300 South Slappey Drive
	Clark Tractor Company
	Gregory Welding Company
	James Equipment Company
	Wisconsin Sales & Service
AMERICUS	Carburetor & Ignition Service
ASHBURN	Georgia Implement & Truck Company
ATHENS	Russell Daniel, Inc.
ATLANTA	* R. S. Armstrong & Bro. Company 676 Marietta Street, N. W.
	Farm Equipment Exchange
	W. L. Holbrook, 523 Stewart Avenue
AUGUSTA	Reel Seed & Feed Company
	Richmond Supply Company
BAINBRIDGE	Bainbridge Truck & Tractor Company
	Harold Tractor Company
BAXLEY	Lewis Brothers
BLAKELY	W. A. Fuqua Live Stock Company
BRUNSWICK	Coastal Chevrolet Company
	Edgy-Wooten Hardware Company
	Kut-Kwick Tool Company, 1927-29 New Castle St.
	Tidewater Equipment Company
CAIRO	Sanders Garage
COLQUITT	J. A. Drake Company
COLUMBUS	Columbus Tractor & Mchry. Company
	McDowell Motor & Implement Company
CORDELE	Cordele Implement Company
CUTHBERT	Cuthbert Tractor & Machine Company
DAWSON	Terrell Implement Company
DOERUN	J. T. Hortman
DONALSONVILLE	Harvey Implement Company
DUBLIN	Walke Implement Company
EASTMAN	McCranie Motor & Implement Company
ELLIJAY	Ellijay Motor Company
FITZGERALD	Martin Manufacturing Company
GAINESVILLE	W. H. Slack, Jr.
GRIFFIN	Lewis Implement Company
JESUP	Salter-Carswell Corporation
KINGSLAND	Kingsland Motor Company
LA GRANGE	Troup Tractor & Implement Company
LANIER	Stubbs Company
LOUISVILLE	Wigham & Beall
LUMPKIN	Singer Company
MACON	C. W. Farmer Company
MOULTRIE	Bynum Implement Company
NAHUNTA	Nahunta Parts & Service
OCILLA	Ocilla Farm Implement Company
PELHAM	Pelham Implement Company
	Rogers Garage
PERRY	George C. Nunn & Son
QUITMAN	Farm Utility Exchange
ROCHELLE	Mashburn & Fitzgerald
SANDERSVILLE	Jesse Newsom
SAVANNAH	Georgia Supply Company
SCOTLAND	Flanders Brothers
SHELLMAN	D. K. Bynum
STATESBORO	Bullock Tractor Company
	Sam J. Franklin Company
	Statesboro Motor & Equipment Company
SWAINSBORO	Emanuel Implement Company
	Stafford & Johnson
SYLVANIA	Stubbs Implement Company
SYLVESTER	Sylvester Truck & Tractor Company
THOMASVILLE	Godwins Garage
	Tuck Implement Company
TIFTON	R. E. Carmichael Company, Inc.
	Orr Tractor Company
	Paulk & McCauley
VALDOSTA	Schroer Implement Company
VIDALIA	Pierson Chevrolet Company
WAYCROSS	Tractor & Equipment Company
WEST GREEN	McGowans Motor Company

IDAHO

ABERDEEN	Tractor Equipment
AMERICAN FALLS	American Falls Implement
ASHTON	Earle Equipment Company
BLACKFOOT	Warren Welding
BOISE	Olson Manufacturing Co., 2223 Fairview Ave.
BUHL	Farmers Equipment Company
BURLEY	Burley Implement Company
CALDWELL	B & M Equipment
	Farmer's Supply Company
CAREY	Wood River Implement
DOWNEY	Christiansen Implement Company
DRIGGS	Valley Tractor
GOODING	Gooding Implement
IDAHO FALLS	Snake River Equipment Company
JEROME	Mehlhaff Tractor Company
LEWISTON	Idaho Cletrac Sales Company, 1515 Main Street
	Jameson Auto Parts
MALAD	Lilenquist Brothers
MONTPELIER	Montpelier Truck & Tractor Company
POCATELLO	Rush Feed, Seed & Implement
PRESTON	Homer Tractor Service
PRIEST RIVER	Kaniksu Tractor
REXBURG	Ray Payne Equipment Company
RIRIE	Snake River Equipment Company
RUPERT	Fairbanks Jones Tractor
ST. ANTHONY	Earle Equipment Company
SALMON	Modern Motors
SANDPOINT	Lou's Auto Parts, 429 N. Second Avenue
SHOSHONE	Shoshone Implement
SODA SPRINGS	Soda Springs Supply
TWIN FALLS	Self Manufacturing Co., Tractor Division 214 Shoshone Street - E.
	Williams Tractor Company
WEISER	H - J - H Company
WENDELL	Gates Bros. Machine Shop
	* Anderson Machinery 404 N. W. Broadway Portland, Oregon
	* Arnold Machinery Company, Inc. 433 West Second South Street Salt Lake City, Utah
	* Star Machinery Company 1741 First Avenue, S. Seattle, Washington

ILLINOIS

ALEDO	Thede Company
ALTON	Stanka Garage, Delmar at State Street
ARTHUR	H. L. Phillips Implement Store
BELLEVILLE	H. Edwards Farm Equipment Company S. 8th Street, Route 13
BLOOMINGTON	Turley Farm Equipment Company
BRIDGEPORT	Abel Bros.
BUSHNELL	Lovell Implement Co., 430 E. Ludwig
CAMBRIDGE	James P. Vinckel
CANTON	Jaeger Implement Company
CARMI	Clinton Murphy Company
CENTRALIA	John Nickell Company
CHENOA	Reiners Implement Company
CHICAGO	* Industrial Engine & Parts Company 2105 S. State Street
CHRISMAN	Keith Culton Implement Company
COLUMBIA	Wm. Vogt & Company
DECATUR	Bruce Implement Company, 929 E. William St.
DeKALB	Ruff & Halverson
EDWARDSVILLE	Madison County Tractor & Equipment Company

ELGIN	Barron Bros., 408 Brook Street
ELIZABETH	Elizabeth Farm Supply
ELKART	E. K. Brooker Company
ELMHURST	Smeja Motors, Lake & Church Road
FAIRBURY	Farmers Implement Company, Inc.
FARMER CITY	Wayne M. Fuller
FISHER	Williams & Neumann
FREEPORT	Stukenberg Implement Sls.
GARRETT	Horton Bros. & Harder
HARDIN	Hardin Tractor & Equipment Company
HOMER	Gardner Service
HUTSONVILLE	Abel Brothers
JACKSONVILLE	Anderson & Cully
JERSEYVILLE	John G. Flautt, 213 S. States
KEWANEE	Germans Service Station
	H & H Oliver Store
KIRKWOOD	Smith Implement Service
LaSALLE	H. A. Linne Company
LOSTANT	Englehaupt & Lyons Impls.
MACOMB	Cole & Kelso
MARISSA	Clyde J. Wylie Tractor Company
MATTOON	Turner Seed & Supply Company
METROPOLIS	Hinners Bros. Company
MILTON	Hoover Bros. Company
MOMENCE	Robert Wille, Inc.
MORRISONVILLE	McVey & Son
MT. STERLING	Earl Knight Motors
MURPHYSBORO	Beckman Implement Company
NIANTIC	Bruce Implement Company
NORTH AURORA	Ted Plantes
OLNEY	Farmers Equipment & Supply Company
	Wilson Sales & Service
PARIS	M. Farnham Implement Company
PAXTON	Power Equipment Company, 228 East State Street
PEORIA	Modern Implement Company
PONTIAC	Farmers Implement Company, Inc.
PRINCETON	Wilds Motor Service Company
PROPHETSTOWN	Thede Company
QUINCY	E. M. Chatten Implement Company
	812-18 Hampshire Street
RIDGEWAY	Robert Abell Implement Company
	Ellis Implement Company
ROCKFORD	Baxter Farm Supply
ROCK ISLAND	Lohse Automotive Service
SHABBONA	George Carr Company
SPRING VALLEY	Burl F. George Company
SPRINGFIELD	Grieme Brothers
	Kerry Auto Electric
STERLING	Mylin's Agricultural Store
STOCKTON	Metcalf Farm Equipment Company
STRONGHURST	The Ross Company, Inc.
VIRGINIA	Hiermans
WALNUT	S. I. Christensen
WATERLOO	H. Edwards Farm Equipment Company
WATSEKA	Watseka Farm Equipment Company
WEST UNION	Union Grain Company
WHEELING	Schneider Implement Company
WINCHESTER	Taylor Implement Company
WINDSOR	Gene Wallace Implement Company
*	Allied Construction Equipment Company
	4025 Forest Park Avenue
	St. Louis, Missouri
*	Engine Power, Inc.
	4320 N. 35th Street
	Milwaukee, Wisconsin

INDIANA

ALBANY	Shroyer Implement Company
ALBION	Truelove Bros.
ANGOLA	Covell Implement Store
AUBURN	Koeneman Farm Equipment Company
BATESVILLE	Wagner & Fledderman
BEDFORD	H. L. McKnight
BLOOMINGTON	Ellis Implement Company
	Graham Motor Sales
BLUFFTON	Moser Implement Company
BRAZIL	Hedge Implement Sales
BREMEN	Bremen Equipment Company
BROOKSTON	Brookston Implement Company
BROOKVILLE	Franklin Supply
CAMDEN	Camden Hardware
CLAYTON	Stanley Implement Company
COLUMBIA CITY	R. D. Clapp & Son
COLUMBUS	Schneider Implement Company
CORYDON	Kenneth H. Brown & Sons
COVINGTON	Kerr-Rayburn Implement Company
CRAWFORDSVILLE	O. E. Straub
CROWN POINT	Gruel Bros.
CULVER	Osborn Seed
DECATUR	Klenk's
ELWOOD	Landrum Implement Company
	McNight Farm Equipment
ETNA GREENE	Ed Heisler
EVANSVILLE	P. E. Phillips & Son
FARMLAND	W. J. Green
FLORA	Humes & Mummert
FORAKER	Hess Bros. Garage
FORT WAYNE	Korte Bros.
	McCullough & Heine
FOWLER	Freeland Auto & Tractor Corp.
FRANCESVILLE	Elmer Swing
FRANKLIN	Alexander Ice & Coal Company
FRANKFORT	Farmers Implement Sales
GARY	Lud's Scooter Sales, 457 Massachusetts Street
GOODLAND	Beckley Implement Company
GOSHEN	Elkhart Co. Farm Bureau Co-op. Ass'n.
GREENCASTLE	Farmer's Supply of Greencastle, Inc.
GREENFIELD	The Carter Company
	Pope Implement Company
GREENSBURG	Thurston Implement Company
HAMMOND	Carstensen's Service Company
	6950 Indianapolis Blvd.
HARLAN	Harlan Farm Supply
HOAGLAND	Hoagland Implement Company
INDIANAPOLIS *	Eagle Machine Co., Inc., 635 E. Market Street
JAMESTOWN	Hoovermale & Hedge
JASPER	Hoffman Bros.
KENTLAND	Kentland Tractor & Implement Company
KNOX	Ray Downs & Sons
KOKOMO	Conwell Implement Company
LaCROSSE	Sumerville Implement Company
LAFAYETTE	Lyman Coal Company
LaOTTA	Brindle Bros.
LEBANON	Potts Implement Company
LIBERTY	Brier Implement Company
LIGONIER	Nighsonger Farm Equipment
LOGANSPORT	Lehnus Bros.
LYONS	Lyons Equipment
MADISON	The Farm Store
MARION	Glasser Electric Company
	Ken's Truck & Tractor Service
MARTINSVILLE	Crews Implement Sales
MELLOT	Kerr Tractor & Implement Company
MODOC	Modoc Sales
MOORESVILLE	D. C. Jessop & Son
MORROCCO	Castogina Tractor & Implement
MONTICELLO	Monticello Sales Company
MT. VERNON	Stephen Implement Company
MUNCIE	Ramsey Tractor Sales
NAPPANEE	Nappanee Implement & Supply Company
NEW CARLISLE	C.C. Kelley & Sons
NEW CASTLE	Wilson Grain & Implement
NEW HAVEN	Farm Implement Store
NOBLESVILLE	Barker Implement Company
OTTERBEIN	Joe Vaughn

OTWELL	Scraper Sales Company
PAOLI	Orange County Supply Company
PENDLETON	Wm. Ring & Sons
PERU	Peru Feed & Farm Equipment Company
	Howard Philabaum, R. R. 3
PLYMOUTH	Downs Brothers
PORTLAND	Justin Schafer Company
PRINCETON	Hunt Motor Sales
RICHMOND	Daggett Implement Company
RILEYSBURG	Dewey Prather
ROCHESTER	Dean Neff
ROCKPORT	Rockport Implement Company
ROCKVILLE	Ray Bolsley
ROLLING PRAIRIE	Wiley & Schultz
ROSSVILLE	Ralph Rodkey
RUSHVILLE	Power Implement Company
RUSSIAVILLE	Martin's Service Station
SHIPSHEWANA	Wana Implement Company
SHELBYVILLE	Needler's John Deere Store
SEYMOUR	Corde's Hardware
SILVER LAKE	Asa Hines
SOUTH BEND	General Equipment & Machine Company
SOUTH WHITLEY	The Farmers Store
SPENCER	Ralph Ketchum
STROH	Stroh Implement Company
SULLIVAN	Monroe Feed & Implement Sales
SYRACUSE	Ward Farm Equipment Company
TERRE HAUTE	Graham Grain Company
TIPTON	Tipton Tractor & Implement Company
VALPARISO	Mark W. Stephens
VINCENNES	Saiter-Morgan Company
WABASH	Wabash Implement Company
WAKARUSA	Jonas A. Miller
WARREN	Daugherty's Farm Equipment Company
WARSAW	Gilliam & Felkner
WASHINGTON	Hart Equipment Company
WESTFIELD	Sheetz Implement Company
WILLIAMSPORT	Stamm Implement Company
WINCHESTER	Goodrich Brothers, Inc.
	Super Farm Store
WINDFALL	Bollinger Brothers
WINIMAC	Winimac Sales Company
WORTHINGTON	Farris Trading Post

* Atlas Auto Parts & Grinding Company
1326-30 W. Jefferson
Louisville, Kentucky

* Industrial Engine & Parts Company
2105 S. State Street
Chicago 16, Illinois

* Womwell Cincinnati Engine & Parts Company
612 Broadway, Cincinnati, Ohio

IOWA

ALGONA	Bradley Brothers
ALTA	Russell W. Peterson
ATLANTIC	Sothman Motor Company
AMES	Ames Motor & Implement Company
BELLE PLAINE	F. L. Sankott
BURLINGTON	Frick Motor Company
CARROLL	Kliewer Implement Company
CEDAR FALLS	Al Matson & Son Implement Company
CEDAR RAPIDS	Wood Tractor Company
CHEROKEE	F. D. Booth Implement Company
COUNCIL BLUFFS	Boyer Implement Shop
DAVENPORT	A. H. Wiese Equipment Company
DES MOINES	* Port Huron Mchry. Company, 301 Court
DUBUQUE	Stampfer's Farm & Home Store
ELDON	Thomas Implement Company
EMMETSBURG	Neary Implement Company
FAIRFIELD	Emory Snakenburg
FARMINGTON	Kimmey's Service
FORT DODGE	Fort Dodge Implement Company
GARNER	Garner Motor Sales
HAMPTON	Mott Implement Company
HOMESTEAD	Amana Society
IOWA FALLS	Manning W. Howell
	Rosene Implement Company
JEFFERSON	Curtis Implement Company
KALONA	Glen Wahl Machine Shop
LENOX	Barker Implement Company
MANCHESTER	Manchester Implement Company
MARION	Marion Machinery Company
MARSHALLTOWN	Central Iowa Farm Store
MASON CITY	Farm Equipment & Supply Company
MELBOURNE	Wiemers Implement Company
MT. PLEASANT	Lloyd Peterson
ONAWA	East Onawa Implement Company
OSAGE	Venticher Implement Company
OSKALOOSA	Lytle Implement Company
PELLA	Mart Hoeksema
PILOT GROVE	J. J. Nichting
PRESTON	Kunau Implement Company
RENWICK	S. H. Klassie
ROCK RAPIDS	Geo. Holliday & Son
SANBORN	Geo. C. Getting
SIOUX CITY	Gene Reilly Farm Store
SPENCER	Harold V. Kabrick
	Sievers Farm Equipment
SPILLVILLE	Balik Implement Store
THOMPSON	Thompson Machinery Company
TIPTON	Brendes Farm Equipment Company
VILLISCA	McCracken Implement Company
WALCOTT	Ray Wulf Company
WAUKON	Valerie Dundee
WEBSTER CITY	Roy Lee Sales & Service Company
WEST UNION	Ralph Pixler & Son

KANSAS

ATWOOD	Deering Supply
ATCHISON	Allen Motor & Implement Company
BAZINE	Erb Repair Shop
	Coolidge Implement Company
BELLEVILLE	Myers Repair Shop
BELOIT	R. P. Fuller & Son
BURLINGTON	Burlington Equipment Company, 506 Neosho St.
	A. B. Caldwell
CAWKER CITY	E. C. Riley Chevrolet Company
CHANUTE	Frank F. Young, 17 S. Ashby Street
CLYDE	Lowers Implement Company
COFFEYVILLE	The Acme Foundry & Machine Company
COLBY	Gunnels Tractor Company
COUNCIL GROVE	Coolidge Implement Company
CUNNINGHAM	Kincheloe Implement Company
DODGE CITY	Scheufler Supply Company, Inc.
EMPORIA	Coolidge Implement Company, 616 Mechanic St.
	Rich Farm Supply
FREDONIA	Homer Neill
GARDEN CITY	Scheufler Supply Company
GOODLAND	Sherman Motor & Implement Company
GRAINFIELD	Grainfield Salvage & Supply Company
GREAT BEND	Scheufler Supply Company
HIAWATHA	Bevan Motor Company, 807 Utah Street
HOLTON	Humphrey Implement Company
HORTON	Phillips Implement Company
HOXIE	Patmon Machine Shop
KANARADO	Mack's Motor Company
LARNED	Scheufler Supply Company, Inc.
LAWRENCE	Anderson Implement Co., 520 W. 23rd Street
LEOTI	Elmer Harkness
LOUISVILLE	Straub Garage
LYONS	Scheufler Supply Company, Inc.
MANHATTAN	O. M. Jorgensen Implement Company
MARION	Marion Machinery Company
McDONALD	Fred's Tractor Service

MINNEOLA	J. H. Rea
OSAWATOMIE	Kenneth R. Johnson, Oil & Gas Well Supplies
OSWEGE	John Sprecher Repair Shop
PALCO	Almand Brault
PITTSBURG	General Machinery & Supply Company 202 North Broadway
	W. A. Thomas Supply Company, 106 W. 3rd Street
PRATT	K. & W. Electric Company
RANSOM	A. H. Cofer
RUSSELL	Scheufler Supply Co., Inc.
SABETHA	Gilbert & Lortscher
ST. FRANCIS	Manson Electric Shop
	Schlittenhardt Motor Company
SEDAN	Chautauqua County Machine Company
SYRACUSE	Kaesler Motor & Implement Company
TOPEKA	M. B. Salisbury Company, Inc., 114 Quincy
WELLINGTON	Knight Machine Shop
WICHITA	* Harley Sales Company, 505 South Main Street
WINFIELD	Hess Engine & Equipment Co., 805 Manning

KENTUCKY

ASHLAND	Barney Williams Company
AUBURN	Auburn Hardware & Implement Company
AUGUSTA	Richey Sales Company
BOWLING GREEN	R. E. Petrie
CLAY CITY	Kennon & Todd Company
DANVILLE	Withers & Crook Implement Company
ELIZABETHTOWN	Hardin County Implement Company
FARMERS	D. R. Perry Supply Company
FLEMINGSBURG	Sousley & Hamm Tractor Company
FRANKFORT	Frankfort Automotive Machine Shop
GEORGETOWN	Robey Farm Supply Company
GLASGOW	G. H. Bowles & Son
GREENVILLE	E. A. Cohen & Son
HARLAN	Womwell Automotive Parts Co.,
HARRODSBURG	Harrodsburg Motor & Implement Company
	Paul Shewmaker Implement Company
HAZARD	Womwell Automotive Parts Co.,
HENDERSON	Henderson Farmers Supply Co.,
HODGENVILLE	A. L. Hazle
HOPKINSVILLE	Planters Hardware Company
LANCASTER	Sanders Supply Company
LEITCHFIELD	Farmers Implement Company
LEXINGTON	* Womwell Automotive Parts Co., 240 Clark Street
	Central Implement Co., 906 West High Street
	Mountain Dew Coal Co., 363 Georgetown Street
	Gregory Taylor Implement Co., Winchester Road
	Wilson Machinery & Supply Co., 561 W. 4th St.
LONDON	Boggs Brothers Implement Company
LOUISVILLE	* Atlas Auto Parts & Grinding Company 1326-30 W. Jefferson Street
MADISONVILLE	Boggess Bros. Farm Equipment Co.
MANCHESTER	Manchester Sales & Service
MAYFIELD	Fuqua Tractor Company
MAYSVILLE	Ellington Farm Machinery
MIDDLESBORO	Lyons & Cox
MONTICELLO	Roberts Implement Company
MOREHEAD	Monarch Supply Company
MT STERLING	Kratzer Implement Company
MURRAY	McKeel Implement Company
NEBO	Stanley Bros.
OWENSBORO	Guenther Hardware Company
PADUCAH	Jones Garage & Farm Equipment
PARIS	Bobbitt & Hudson Implement Company
	Bourbon Implement & Welding Company
PIKEVILLE	Womwell Automotive Parts Company
RICH POND	R. E. Dillard Implement Company
RICHMOND	Cornelison & Moores Brothers
SCOTTSVILLE	Claypool & Weaver Implement Co.
SHELBYVILLE	Shelbyville Supply Company
SOMERSET	Morris Brothers
STANFORD	Thompson Motor Company
SUMMERSVILLE	Holman Lewis Implement Company
WILLIAMSBURG	Shaw Motor Parts Company
WILLIAMSTOWN	Pettitt Machinery Company
WINCHESTER	M. T. Smith Company
	Stevenson & Delaney

LOUISIANA

ABBEVILLE	Landry Stores, Inc.
BATON ROUGE	Alford Safe & Lock Company
BOSSIER CITY	Wilbanks Farm Equipment Company
DELCAMBRE	Dooley Bros. Machine & Welding Shop
DES ALLEMAND	Bayou Electric
GRETNA	Gretna Specialty Company, 813-4th Street
HAMMOND	Hammond Wholesale Company
HOUMA	Lynch's Garage
JENNINGS	Farm Machinery & Equipment Company, Inc.
LAKE ARTHUR	Lake Arthur Machine Shop
LAKE CHARLES	C. E. Kemmerly & Sons
LOCKPORT	Lockport Hardware Company
MONROE	Southern Equipment & Tractor Company
NATCHEZ	Hammett Supply Company
NATCHITOCHES	C. E. Collins & Sons
NEW IBERIA	Voorhies Machine Supply Company
NEW ORLEANS	* Wm. F. Surgi Equip. Co., 1017 Magazine Street
	Southern Specialty Sales Co., 617 N. Broad St.
OPELOUSAS	Cary Iron Works
PONCHATOULA	Air Cooled Motor Company
RAYNE	Haure Machine Shop
SCOTT	Machinery & Equipment Sales Company
SHREVEPORT	Construction Machinery Corp.
	Harold's Sales & Service
TALLULAH	Powell Tractor Company

MAINE

AUGUSTA	Parker Danner Company, Riverside Drive
HOULTON	James S. Peabody Company, Bangor Street
PORTLAND	Portland Tractor Company, 803 Forest Avenue
PRESQUE ISLE	Roy C. Thompson Company, 253 Stae Street
	* Diesel Engine Sales & Engineering Corp. Fish Pier Road Boston, 10, Massachusetts

MARYLAND

ANNAPOLIS	John M. Dawes & Sons, 142 Dock Street
BALTIMORE	* Phillips Mchry. & Tractor Co., 325 W. 23rd
	Alban Tractor Co., Inc., 725 E. 25th Street
	L. A. Benson Company, Inc., 6 E. Lombard
	Chesapeake Supply & Equipment Company 1213 E. 25th Street
	Stuart M. Christhilf & Company 134 W. Mt. Royal Avenue
	Curtis Engine & Equipment Co., 104 Light St.
	Del-Mar-Va Marine Sales, 10 W. Cromwell Street
	D. C. Elphinstone, Inc., 115 S. Calvert Street
	General Supply & Equipment Co., 530 E. 25th St.
	Loane Machinery Co. Inc., 208 S. Hanover Street
	John C. Louis Company, Inc., 511 W. Pratt St.
	Henry M. Meyer Company, Inc., 110 S. Howard St.
	Paving Supply & Equip. Co., 25th & Bonaparte Ave.
BEL AIR	B. D. Tucker & Sons
CAMBRIDGE	E. S. Hubbert & Son
CHESTERTOWN	D. W. Ingersoll, Silver Hill Shop
EASTON	Elco Equipment Company
ELKTON	Elkton Boat Yard
FREDERICK	H. D. Duvall
GAITHERSBURG	S. F. Smith
HAGERSTOWN	American Growers Supply Company
	Downey Brothers, W. Washington Street, Ext.
	Fearnow & Cline
HURLOCK	H. E. Parker & Son

LEONARDTOWN	Atlas Hardware & Supply Company
MAYO	Cadel Creek Boat Works
OCEAN CITY	C. P. Cropper Fish & Oyster Company
SALISBURY	Salisbury Battery Company
	Taylor Auto Supply Company
SHADYSIDE	Shadyside Boat Yard
SILVER SPRINGS	The Todd Company, 936 Philadelphia Avenue
SUITLAND	J. A. West, Jr., Suitland Esso Service
THURMONT	Farm Equipment Center

MASSACHUSETTS

BOSTON 10	* Diesel Engine Sales & Engineering Corp. Fish Pier Road
DANVERS	Clifford T. Whittaker Company
GREENFIELD	Center & Whitlock, Inc., 12 Deerfield Street
HOLYOKE	Holyoke Farm Machinery Company, 115-111 High
HYDE PARK	Parker-Danner Company, Factory Street
NATICK	Robinson Farm Machinery Company

MICHIGAN

AKRON	McDonald Sales & Service
ALBION	Fred C. Zuehlke
ALMA	Browns Auto Equipment
ALPENA	Everett Smith
BARCULO	Bussis Implement Company
BARK RIVER	Bark River Farm Implement Company
BARODA	Baroda Hardware
BATTLE CREEK	Farm Equipment Company, 1210 E. Columbia
BAY CITY	Sam Wieland, 801 N. Euclid Street
BAY SHORE	Burnett Brothers
BEULAH	Benzie Company
CENTERVILLE	John S. Jackson
CHARLOTTE	Fowler Sales Company
CLARE	Orville Vandawarker
CLAWSON	Roy Steele Equipment Company
CLINTON	Vaughn Implement Company
COHOCTAH	R. E. Pekins
COLDWATER	Endicott Implement Company
COMSTOCK PARK	Morrissey Farm & Orchard Supply
CONKLIN	E. F. Dinkel
DAVISON	Amos Sales & Service
DECATUR	Decatur Farm Service
DETROIT	* R.G. Moeller Company, 14415 Meyers Road
DUNDEE	Karner Brothers
EAST TAWAS	Wm. Look & Son
ELK RAPIDS	Elk Rapids Auto Service
ELKTON	J. R. Quinn
ELLSWORTH	Klooster, Conrad
ESCANABA	Escanaba Trading Post
EVART	Leach Farm Equipment Company
EWEN	Strnad Implement Company
FENNVILLE	Fennville Hardware
FLATROCK	Hamilton Appliance, 26416 Telegraph Road
FLINT	Matthews Sales & Service
FOWLER	Huggett Hardware & Implement
	Whittaker Bros.
FOWLERVILLE	Marshall Lintenmuth
FRANKENMUTH	H. J. Schluckebier
HANCOCK	Gus Waarala & Sons, Company
HARRISVILLE	Jensen & Healy
HARTFORD	Hilltop Orchards
HASTINGS	B. L. Peck
HILLMAN	Main River Farm Equipment
HILLSDALE	Kennedy Implement Company
HOLLY	Frank Gromak
HUDSON	Rollin Clark, Inc.
IMLAY CITY	Imlay City Implement Company
IRON RIVER	Guy's Auto Shop
ITHACA	Leslie D. Reeves
JACKSON	Superior Sales
KALAMAZOO	Howard Hopkins, Inc., 513 E. Kalamazoo Avenue
	R. G. Moeller Company of Kalamazoo 248 N. Edwards Street
KEWEENAW BAY	Koski Repair Works
LANSING	Bert Howard Company, 1419 Turner Avenue
LAPEER	Inman Farm Equipment
MARLETTE	Henry Diem
MARQUETTE	Marquette Public Service Garage
McBAIN	McBain Hardware
McBRIDE	Parr & Son
MENOMINEE	Linsmeier Implement Company
MESICK	Frank Saul
MILLBURG	L. Gelder & Sons
MIO	Herold Hebestrait
MONTAGUE	Hunt Sales & Service
MUSKEGON	H. G. Davis & Son
NEWPORT	McCord Farm Supply
OWOSSO	Wieland Farm Sales
PLAINWELL	Eugene Vis
RICHMOND	J. C. Ernst
ROCHESTER	Houghton & Sons
ROMULUS	Hugo Unger
ROSE CITY	Reasner Service
RUTH	Ruth Farmers Elevator Inc.
SANDUSKY	Robert E. Cork
SAULT STE. MARIE	Armstrong Supply Company
SCOTTS	White Sales Company
SCOTTVILLE	Kaye Implement Company
	Howard Thiel
SEBEWAING	Dembowske Sales Company
SHELBY	Shelby Ford Tractor Sales
SKANDIA	Heath Implement Company
SOUTH HAVEN	Michigan Orchard Supply
SOUTH IONIA	F&H Grounds Farm & Home Supply Company
SPRINGPORT	Vern Losey
STANDISH	Miscisin Brothers
STURGIS	Lake Motor Sales
TRAVERSE CITY	Mapleton Garage, RFD #1
UNION CITY	Knauss Implement Company
UTICA	Harry E. Lansing
VANDALIA	Elk Park Equipment Company
WEST BRANCH	Chas. Wangler
YALE	Robert Ed. Martin Implement Company

(NORTHERN)

* Engine Power, Inc.
4320 N. 35th Street
Milwaukee, Wisconsin

MINNESOTA

ADAMS	Mielenacker Implement Company
ALEXANDRIA	M&H Motor Builders
AMBOY	Coulter Implement Company
APPLETON	LaGrange Chev. Company
AUSTIN	Adams Farm Equipment Company
BERTHA	Henry W. Harms
BLUE EARTH	Smith Implement Company
CHASKA	Molnau Implement Company
COMFREY	Rinehart & Fesenmaier
CROOKSTON	L. W. Wentzel Farm Implement
	Wm. H. Ziegler Company, Inc.
DULUTH	Sivertson Marine Equipment Co., 336 Lake Ave. S.
	Smith-Dunn Co., Inc., 18 North 19th Ave. W.
	Wm. H. Ziegler Company, Inc., 330 Garfield Ave.
ELBOW LAKE	Christianson-Shervey Company
FARIBAULT	Spitzack Implement Company
FERGUS FALLS	National Bushing & Parts Company
	C. T. Oscarson & Son
FREEPORT	Freeport Implement Company
FULDA	Fulda Implement Company
	J. B. Janssen Implement & Aero. Service
GLENCOE	Newman & Tanner Company
GRAND MEADOW	Myhre & Seim Implement Company

GRAND RAPIDS	Hein Implement Company
HALLOCK	Bryden & Johnson Implement Company
HARMONY	Trouten & Boice
HAWLEY	Heimark Bros.
HOUSTON	Houston Implement Company
HUTCHINSON	C. H. Stocking Company
KENNEDY	Kennedy Implement Company
LAKE CITY	Danckwart Implement Company
LAKE LILLIAN	Wm. R. Johnson Motor Sales
LAMBERTON	Lamberton Implement Company
LeSUER	King Oil Company
LISMORE	Lismore Implement Company
LITCHFIELD	Litchfield Supply Company
LITTLE FALLS	A. J. Smith Company
MADELIA	James Bros. Company
MANKATO	Cutkosky & Jones Company
	National Bushing & Parts Company
MARSHALL	Schrunks Garage
MINNEAPOLIS	Industrial Truck & Parts Company 1301 Washington Avenue S.
	Minneapolis Equipment Company 520 Second Street S.E.
	National Bushing & Parts Co. 1221-9 Harmon Place
	Wm. H. Ziegler Company, Inc. 2929 University Avenue S.E.
MONTEVIDEO	Campbell Implement Company
MORRIS	Baer & Swenson Company
NEW ULM	Clauss Implement Company, Inc.
NORTHFIELD	Nelson Service
OLIVIA	M. W. Hertel Company
OSAKIS	O'Hotto Supply
OWATONNA	C. J. Ost Farm Implement Company
PIPESTONE	Walkup
PRESTON	Preston Iron Works
RED WING	National Bushing & Parts Co.
REDWOOD FALLS	Fall Implement Company
ROCHESTER	National Bushing & Parts Co.
	Swenson Implement Company
ROGERS	Otto J. Scharber & Sons
ROTHSAY	Lindberg Motor Company
RUSHFORD	Morken's Service
SAINT CLOUD	National Bushing & Parts Co.
SAINT JAMES	Wick Implement Company
SPRING GROVE	Foss Motor Sales
THIEF RIVER FALLS	Taxeraas Implement Company
TRACY	Tracy Implement Company
WACONIA	Koch Implement Company
WASECA	Waseca Implement Company
WELLS	Wm. Moll & Sons
WENDALL	Christianson-Shervey Company
WHEATON	Christianson-Carlson Company
WILLMAR	John Peterson Implement Company
WINDOM	Mulligan & Andrews
WINONA	F. A. Krause Company
WORTHINGTON	Western Implement Company
	* Engine Power, Inc. 4320 No. 35th Street Milwaukee 9, Wisconsin

MISSISSIPPI

ABERDEEN	Lann & Carter Hardware Company
ACKERMAN	Covington's Garage & Tractor Service
AMORY	Dalrymple Equipment Company
BOONEVILLE	Browns Feed Store
CLARKSDALE	Wilson Tractor Company
CLEVELAND	Cleveland Machine Company
GREENVILLE	Thompson Battery & Electric Company
GREENWOOD	R. M. Brown Implement Company
GRENADA	J. H. Biddy & Son
GULFPORT	Modern Tractor & Appliance Company
HATTIESBURG	Beamont Sporting Goods Company
INDIANOLA	Indianola Tractor Company
JACKSON	Mills Morris Company, S. State Street
KOSCIUSKO	Wambles Machine Shop
LELAND	Ayres Company
LOUISVILLE	Taylor Machine Company
MACON	Noxubee Implement Company
MARKS	Marks Tractor Company
NATCHEZ	Hammett Supply Company
PHILADELPHIA	Moore Hardware & Implement Company
SENATOBIA	E. E. Moore & Company
TUPELO	Coley-Johnson Implement Company
WEST POINT	Moseley Implement Company
WINONA	Ellis Motor Company
YAZOO CITY	Saxton Gardner Hardware Company
	* Lewis Diesel Engine Company Main at Butler Memphis, Tennessee
	* Wm. F. Surgi Equipment Company 1017 Magazine Street New Orleans, Louisiana

MISSOURI

BETHANY	Beeler Implement Company
BOLIVAR	Butler Implement Company
BOWLING GREEN	Deters Farm Equipment Company
CAPE GIRARDEAU	Schneider Equipment Company Highway 61 & Bloomfield Road
CANTON	Canton Implement Company
CARTHAGE	Jacobs Implement Company
CHARLESTON	Charleston Motor Co., 219 W. Commercial Street
	French Implement Company
CHESTERFIELD	Chesterfield Farmer Elev. & Supply Company
CHILLICOTHE	Barnes Implement Company
CLINTON	Mansfield's
COLUMBIA	Lance D. Henderson Implement Company
De SOTO	Bender-Schulz Tractor & Equipment Company
DEXTER	Dexter Motor & Implement Company
EAST PRAIRIE	Charleston Motor Company
	French Implement Company
ELSBERRY	Elsberry Equipment Company
ESTHER	R. E. Larkin
FAYETTE	Ellerman Motor Company
FREDERICKTOWN	Paul Skaggs & Sons, Highway 61
FULTON	Maintenance & Engineering Service Company
HANNIBAL	Harrison Motor Company, 3716 McMaster Avenue
HARRISONVILLE	Harvey Implement Company
HAWK POINT	Martinek's Garage
JEFFERSON CITY	Raithel Implement Company, 605 Mulberry St.
JOPLIN	Dave's Magneto Service, 1702 W. 3rd
KANSAS CITY	* A. A. Klughartt Machinery Company 1205 Woodswether Road
KEWANEE	Farm Implement Company
KIRKSVILLE	Mitchell Implement Company
LANCASTER	Beeler Implement Company
LIBERTY	Wymore & Son
LOUISIANA	Farm Supply Company, 3rd & Alabama
MACON	Strong Equipment Company
MALDEN	The Stokes Motor & Implement Company
MARSHALL	Whitlock Coal & Implement Company
MARYVILLE	Carson-Wray Implement Company
MEXICO	Fred E. Hollingsworth, 112 Monroe Street
MONROE CITY	Mr. C. O. Simpson
MONTGOMERY CITY	Ray Oliver
NEOSHO	Killingsworth Motor & Implement Company
ORCHARD FARM	Otto Wilke
OWENSVILLE	Crowder & Ruffner Motor Company
PARIS	Hempstead Implement Company
PERRY	Anderson Equipment Company
PERRYVILLE	Prost Implement Company
PILOT KNOB	Furry Equipment Company
POPLAR BLUFF	Miller Tractor & Implement Company
ROLLA	Ozark Equipment Company, Inc.

ST. CHARLES	Otto Wilke
ST. CLEMENT	Deters Farm Equipment Company
ST. JOSEPH	Farm Supply Company
ST. LOUIS	* Allied Construction Equipment Company 4025 Forest Park Avenue Forest Park Lumber & Supply Company 6325 Clayton Avenue Machinery Incorporated, 5081 Manchester Ave. The Geo. F. Smith Company, Inc. 5215 Manchester Avenue
SALEM	Floyd Brothers Implement Company
SEDALIA	M. F. Wahrenbrock Implement Company 1301 South 65 Highway
SIKESTON	DeKriek Farm Equipment Co., Highway 60 East
SILEX	Mudd Equipment Company
SPRINGFIELD	Chapman & Whitlock Implement Company Engle Implement Company
TRENTON	Tractor Sales & Service
WASHINGTON	Stoenner Farm Equipment Company
WAYLAND	Wilson Implement Company

MONTANA

BILLINGS	* Midland Implement Company, Inc.
BOZEMAN	Empire Auto & Implement
CHESTER	Chester Implement Company
CUT BANK	Cut Bank Motors
GLENDIVE	Kampschror Implement Company
GREAT FALLS	Johnson Farm Equipment, Inc. Midland Implement Company, Inc.
HARDIN	Ray Morissette
HELENA	Steffeck Equipment Company
KALISPELL	Croskery-Carlson Company Garey Motors
LEWISTON	Lacy Implement Sales
MILES CITY	Miles & Ulmer Company
MISSOULA	H. O. Bell Company Davies Farm Supply Company
PLENTYWOOD	Holje Implement Company
SHELBY	K & T Implement Company
WOLF POINT	Ibsen Implement Company

NEBRASKA

AINSWORTH	Kennedy Equipment Company
ALLIANCE	Cover-Jones Implement
ANSELMO	Anselmo Hardware & Equipment
AUBURN	White Farm Supply
BAYARD	Yekel Implement Company
BEATRICE	Henderson Farm Equipment Company
BLOOMFIELD	M & L Implement Company
BRIDGEPORT	Bridgeport Equipment Company
CEDAR RAPIDS	Kayton Implement Company
CENTRAL CITY	Hilder Implement Company
CHADRON	Chicoine Motor Company
CHAPPELL	Deuel County Implement Company Heileger & Hall
COLERIDGE	Gene's Blacksmith Shop
COOK	Mannschreck Implement Company
FAIRBURY	Ralph E. Turner & Son Implement
FALLS CITY	Bauer Implement Company
GENEVA	Chaney Implement
GIBBON	Schinkel Implement Company
GORDON	Elmer Davis Repair Shop
GOTHENBURG	Lepp & Osterloh
GRAND ISLAND	Midwest Farm Equipment
GREELEY	Yilk Implement Co.
HASTINGS	Sherman Service Center
HEMINGFORD	Burney Bros. Implement
HOLDREGE	Holdrege Machinery Company
KIMBALL	Larson Farm Machinery
LINCOLN	* Port Huron Machinery & Supply Company 801-813 "Q" Street
LYONS	Hans Nelson Implement & Garage
McCOOK	Kleins Motor & Electric
MORSE BLUFFS	Joe Fencl Repair Shop
NELIGH	Reinke Implement
NORFOLK	Spangenburg Implement
NORTH PLATTE	Schlientz Implement
ODELL	Callan Hardware & Implement
OMAHA	American Auto Service Anderson Equipment Company
ORD	Schoenstein Motor & Implement
PIERCE	Kolterman Service Company
SCHUYLER	Hamata Bros.
SEWARD	Rolfsmeier Implement
SIDNEY	Larson Machinery Co.
SNYDER	Hartman Vackiner
SPRINGFIELD	Iske Implement
SUTTON	Jacob Bender & Son
TILDEN	Cram Implement
WAKEFIELD	Schroeder's Store
WALTHILL	Dale Benter
WAUNETA	Rowley & Walgren
WEST POINT	Zobel Farm Store
WISNER	Severson Implement

NEVADA

ELKO	Bellinger Repair Shop
ELY	Ely Lumber & Coal Company
FALLON	I. H. Kent Company
LOVELOCK	Lovelock Welding Shop
LUND	Reid & Carter
RENO	Air Service Company, 241 S. Virginia Street Sierra Machinery Company, 1025 E. 4th Street
YERINGTON	Lommori Bros. * Arnold Machinery Company, Inc. 433 West Second South Street Salt Lake City, Utah * Continental Sales & Service 1950 Santa Fe Avenue Los Angeles, California * E. E. Richter & Son 5725 Hollis Street Emeryville, California

NEW HAMPSHIRE

CONCORD	New Hampshire Explosives & Machinery Company 261 S. Main Street
MANCHESTER	Dunbar Farm Equipment Co., 340 Massabesic St.
WALPOLE	R. N. Johnson, Inc., Bellows Falls Road * Diesel Engine Sales & Engineering Corporation Fish Pier Road Boston 10, Massachusetts

NEW JERSEY

ATLANTIC CITY	Ploettner Machine Works
BLAWENBERG	J. Percy Van Zandt
BRANCHVILLE	The Roy Company
BRIDGETON	J. L. Danzenbaker
CAMDEN	Hagner, Inc. New Jersey Marine Service & Supply Company
CAPE MAY	Congress Auto Supply
DELANCO	Evans Auto Parts, P.O. Box 359
EGG HARBOR	J. S. Thorpe
FREEHOLD	Sidney W. Reid, Rt. 4 - State Highway
GREAT MEADOWS	B & J Farm Service
HAINESPORT	Paul's Motor Service
HARMONY	Paul M. Souders
HIGHLAND PARK	Kish Brothers
HILLSIDE	H. J. Zoubek Company, Ramsey Avenue & Bley St.
MANAHAWKIN	Walker-Tanger, Inc.
NESHANIC STATION	J. S. Covert & Son

NEWARK	Dale & Rankin Inc., 23 Sussex Avenue
PALMYRA	Deleware Boat Works
PLAINSBORO	Isaac Barlow & Son
SALEM	Pearson Supply Company
TRENTON	Ufert Auto Parts
WESTFIELD	Storr Tractor & Equip. Company, 469 South Ave.
WICATUNK	Conover Bros.
	* John Reiner & Company 12-12 - 37th Avenue Long Island City, New York
	■ Service Supply Corporation 20th & Venango Streets Philadelphia, Pennsylvania

NEW MEXICO

ALBUQUERQUE	Bud Fisher Company
	Contractors' Equipment & Supply Company
ARTESIA	Union Supply Company
CARLSBAD	Young Implement Company
CIMMARRON	Cimmarron Mercantile Company
CLOVIS	Bline Machinery Company
FARMINGTON	Justis Supply Company
HOBBS	Union Supply Company
	West Texas Sales Company
	■ Central Supply Company 12th & Lincoln Denver, Colorado

NEW YORK

AMSTERDAM	Shelp & Warner Company, 24 River Street
AVON	Mark J. Davin
BOLIVAR	J & C Magneto
BUFFALO	R. G. Fox, 242 Hopkins Street
CANANDAIGUA	Donald Howard
COLLINS	Collins Service Agency
COOPERSTOWN	Earl C. Chase & Sons
CORAM	Municipal Machinery Company
DELEVAN	John L. Waring
DEPOSIT	Deposit Farm Supply, 147 Second Street
ENDICOTT	Newing Motor Company
HIGHLAND	Schmidt Brothers
HOMER	A. B. Brown & Son
HORSEHEADS	Horseheads Tractor & Implement Company
HUDSON	Burtnett Implement Co., Route 9, Slottsville Rd.
ITHACA	Allen Tractor & Equipment Service 901 West Buffalo Street
LeROY	Bickford Brothers
LIBERTY	Clinton P. Tompkins
MIDDLEPORT	Clayton & Dickinson, Johnson Creek
NEW YORK CITY	* John Reiner & Company 12-12 - 37th Avenue, Long Island City
OWEGO	Herbert M. Petzold Equipment Company 5th Avenue, Route 17C
PINE ISLAND	Ed. Murtha
POUGHKEEPSIE	J. E. Andrews Hardware Company, 279 Main St.
RENSSELAER	Van's Equipment Sales, Inc., Route 9
ROCHESTER	Keystone Builders & Supply Company, 85 Palm St.
SCHENECTADY	Scotia Machine & Tool Co., Inc.
SHERBURNE	R. R. Jones, North State Street
SYRACUSE	Atlantic Tug & Equip. Company, 441 S. Salina
	Reliable Machine Motor Parts Company 940 North Salina Street
WARWICK	Harry Van Duynhover, 30 Welling Place
WALDEN	Orange Tractor & Equipment Company
WATERLOO	Finger Lakes Equipment Company
WATERTOWN	Northern Implement Company, 215 Coffeen St.
WEBSTER	Earl D. Wright, 178 Phillips Road

NORTH CAROLINA

ALBEMARLE	Hatley Supply Company
ASHEVILLE	Fitzpatrick & Sons
BEAUFORT	Barbour's Marine Supply Company
	Machine & Supply Company
BURLINGTON	Foster Farm & Machinery Company
CHARLOTTE	Contractors Service, Inc.
	Godley Brothers Implement Company
	H. B. Owsley & Son
	C. S. Proctor Implement Company
	E. J. Smith & Sons Company
CHINA GROVE	General Farm Equipment Company
DUNN	Johnson Cotton Company
DURHAM	J. C. Markham & Sons
ELIZABETH CITY	Farmers Supply Company
FAYETTEVILLE	Hyman Supply Company
	Proctor-Barbour Company
FUQUAY SPRINGS	Proctor-Barbour Company
GOLDSBORO	Johnson-Sherman
GRANITE FALLS	F. L. German Motor Company
GREENSBORO	* E. F. Craven Company
GREENVILLE	R. F. McLawhon & Sons
HENDERSONVILLE	Francis & Wright, Inc.
KINSTON	Johnson-Sherman Company
LAUREL HILL	Z. V. Pate Company, Inc.
LAURINBURG	Butler Tractor Company
LENOIR	Lenoir Farm Equipment Company
LEXINGTON	Leonard & Tucker Machine Shop
LUMBERTON	Johnson Cotton Company
MANTEO	Davis Boat Works
MONROE	Quality Chevrolet Company
OXFORD	Morton-Sherman Implement Company
RALEIGH	S. M. Crocker & Son
	Dillon Supply Company
ROCKY MOUNT	The Daniel Company
	Dillon Weaver Implement Company
	Johnson Cotton Company
SANFORD	Budd-Mann Company
SHELBY	O. E. Ford Company
SPRUCE PINE	Mitchell Distributing Company
STATESVILLE	Watts & White Machine Company
SWANSBORO	Casper Marine Service
WADESBORO	Teal Implement Company
WASHINGTON	W. C. Mallison & Son
	Talley Implement Company
WHITEVILLE	S. L. Fuller & Company
WILLIAMSTON	Reddick Equipment Company
WILMINGTON	R. F. Hall & Son, Inc.
	Marks Machinery Company
WINSTON-SALEM	Etchinson Machine Works

NORTH DAKOTA

BEACH	W. L. Hammond
	Hardy Motor Company
BELFIELD	A. J. Krushensky
BISMARK	Western Auto Parts Company
BOTTINEAU	Bottineau Implement
BOWBELLS	Bowbells Hardware & Implement Company
BOWMAN	Omer Sheets
	Stuber Farm & Ranch Store
CARRINGTON	Nichelson & Carr
COOPERSTOWN	Griggs County Implement
CROSBY	Gubrud Implement
DEVILS LAKE	Western Auto Parts Company
DICKINSON	Bogner Implement
	Hecker Garage
	Slope Motor Implement
DUNN CENTER	Dunn Center Motor
EDGELEY	Kipp Chevrolet
EDINBURG	Evenson Machine Company
ELGIN	Alt Supply
	Laub Motor Sales
ENDERLIN	Dakota Motor
EPPING	Epping Motor Company

FARGO	Myhra Equipment
	Western Auto Parts Company
FLORA	R. Pope
FESSENDEN	Wells County Implement
FORMAN	Dahl Implement
	Forman Implement
GLADSTONE	Gladstone Lumber Company
GLEN ULLIN	Curfew Elev. Company
	Glen Ullin Roller Mills
GRAFTON	Zeidler Implement
GRAND FORKS	Legwold Farm Equipment
GRENORA	Price Implement
HARVEY	Seltvedt Implement
HAZEN	Hazen Motor Company
HEBRON	Wolter's Supply
HETTINGER	Clark Motor Company
	Hettinger Implement
HILLSBORO	Aalsaker Implement
HOPE	Fuller Land Company
JAMESTOWN	Michelson Implement
	Western Auto Parts Company
KILLDEER	Dunn Center Motor Company
	Motor Inn
KINDRED	Plath Implement
LaMOURE	LaMoure Auto Implements
LANGDON	LeBrun Implement
LANSFORD	Lansford Implement
LINTON	Linton Auto & Implement
MADDOCK	General Supply
MANDAN	Western Auto Parts Company
MAYVILLE	Moen Implement
MEDINA	Medina Implement
MINOT *	Western Auto Parts Co., 308 - 2nd Street, S.W.
	Waterman Implement
MOHALL	Steinberg Implement
MOTT	Wangsvick's Implement
NECHE	Letzring Implement
NEW ENGLAND	New England Implement
NEW ROCKFORD	Shafer Machine Shop
NEW SALEM	Toepke Chevrolet
OAKES	Emil Tedin
PAGE	Ruthford Hardware
RAY	Ray Implement Company
REEDER	Walch Bros.
REGENT	Farmers Union Oil Company
RICHARDTON	Jos. Kilzer & Sons
ROLLA	Rolla Implement
SOURIS	Oscar Olson
SOUTH HEART	Farmers Union Oil Company
UPHAM	Anderson Implement
VENTURIA	Tesky Garage
WALHALLA	Walhalla Motor
WESTHOPE	Page Motor Company
WILLISTON	Gubrud Bros.
	Western Auto Parts Company
WILLOW CITY	C. G. Emery

OHIO

ARCHBOLD	Grieser's Farm Equipment Company
ATHENS	Nye Chevrolet Company
BALTIC	Farmerstown Machine Company
BATAVIA	Anstaett Farm Service
BIRMINGHAM	Howe & Bickel
BRYAN	Arnold Wood Farm Service
CADIZ	J. Ed Sinclair
CALDWELL	R. D. Buckey
CAMBRIDGE	Major Equipment Company, 919 Woodlawn Avenue
CANFIELD	C. O. Probst
CANTON	C. L. Maier Truck & Implement
	1600 E. Tuscarawas Street
CENTERVILLE	Smith Hurst Tractor Sales
CHILLICOTHE	Drummond Implement Company
CINCINNATI *	Cincinnati Engine & Parts Co., 2525 Vine St.
	Van Atta Seed Company
CIRCLEVILLE	Wood Implement
COLLEGE CORNER	College Corner Implement Company
COLUMBIANA	Paul Witmer & Sons, R. D.
COLUMBUS	Howe-Simpson, Inc., 136 E. Gay Street
	Jacobsen Power Lawn Mower Company
	833 Grandview Avenue
COSHOCTON	F. D. McIntosh
CYGNET	Clift Implement Service
DANVILLE	McMillan Farm Implement
DAYTON	Flack Equipment Company
DELAWARE	Hart & Stout, 36 N. Union Street
	John W. Shultz Sales & Service
DESHLER	Crawford Bros. Garage
EATON	Barber & Conley
ELIDA	Suburban Machine Shop, Box 21
EWINGTON	J. M. Jackson
FREMONT	Goodman Equipment
GALION	Galion Farm Service, Inc., 322 S. Market St.
GALLIPOLIS	White Implement Company, 218 3rd Street
GRAFTON	Grafton Motor Sales, Inc.
GREENVILLE	Dancer's Garage, 304 - 12th Street
HARRISON	Strimple Implement Company
HARTVILLE	Archs Implement & Supply
HILLIARDS	Standard Tractor & Equipment
JACKSON CENTER	Wiessinger Sales
JOHNSTOWN	Farmer's Supply
KENTON	McFadden Implement Company
KINGSTON	Jones Implement Company
LANCASTER	Faler Hardware, 821 W. Fair Avenue
LEBANON	McCurley Implement Company
LIMA	Flack Equipment Company, 1420 Elida Avenue
LISBON	Shaw & Bates, 112 W. Washington Street
LOGAN	Fred Hack Auto Supply, 120 E. Main Street
LONDON	Martin Welding Shop, 67 N. Central Street
MANSFIELD	Lust Implement Company, 140 N. Main Street
MARIETTA	Farm & Orchard Supply Company, 619 Third Street
	Marietta Ignition Service Sta., 181 Front St.
MARION	Dutt Implement Store
McARTHUR	George Benson & Son
McCLURE	McClure Sales & Service
MENTOR	Earl Ives Equipment Co., 1585 Mentor Avenue
MIDDLEFIELD	Wm. E. Hostetler
MILAN	Meyers & Heckelman
MINSTER	Streacher's, 19 S. Main Street
MT. STERLING	Emrick Implement Company
NEWARK	Wilkin Farm Store, 21 N. 4th Street
NORWALK	Norwalks Parts Company
OAK HARBOR	Oak Harbor Tractor Sales, 300 W. Water
PATASKALA	Parr Implement Company
PAULDING	Sinn Repair Shop
RUSSELL'S POINT	Wedge Boat & Motor Sales
RUSSELLVILLE	Russellville Implement Company
ST. CLAIRSVILLE	Efaw Battery & Electric Company
	303 S. Market Street
SALEM	Salem Service & Supply, 135 S. Howard Street
SCIO	John B. Harrison
SOUTH ZANESVILLE	Zanesville Rubber & Supply, 71 Maysville St.
STEUBENVILLE	Fellows Feed & Supply Company
TIFFIN	H. Walton & Son
TOLEDO 4	Flack Equipment Company, 235 Broadway Avenue
	The Banting Company, 1150 Central Avenue
TROY	Sarver Implement Company
UPPER SANDUSKY	Schmidt Machine Company
VAN WERT	Wortman Bros. Company, 214 N. Market Street
WAPAKONETA	White's Garage
WELLSTON	Deinzer Auto Parts Company
WESTVILLE	Smith Farm Equipment
WOOSTER	Agricultural & Industrial Service
YOUNGSTOWN *	McCune & Company, 3721 Mahoning Avenue
	Stiles Service Shop, 3425 Market Street

ZANESVILLE	Geo. H. Gillogly's Stores
	* Eagle Machine Company, Inc. 635 E. Market Street Indianapolis, Indiana

OKLAHOMA

ADA	Theimer Implement Company
ALVA	Devery Implement Company
ARDMORE	Murphey Machine & Supply Company
BLACKWELL	Chermack Farm Equipment Co., 809 S. Main St.
BRISTOW	R. A. Krumme, 207 E. 7th Street
CLINTON	Fred W. Wagner, Sales & Service
CORDELL	Hagin Farm Equipment Company
DEWEY	Star Machine Works
DUNCAN	Motor Parts & Service Company
DURANT	Durant Implement Company
EL RENO	Vieth Bros.
ENID	Art's Machine Shop, 412 N. Independence
FREDERICK	Frederick Hardware Company
	Whittler Implement Company
GUTHRIE	Oil Fields Manufacturing Company
GUYMON	Claycomb Electric Company
HEALDTON	Lewis Magneto & Ignition Company
HOLDENVILLE	H. D. Maloy Implement Co., 111 S. Creek Street
KINGFISHER	Vieth Bros., 106 E. Miles Street
LAWTON	McWhorter Implement Company
LINDSAY	Crawford Products Company
MADILL	Sterling Machinery Company
MEDFORD	Scouten-Webster Equipment Company
NOWATA	Keystone Supply Company
	Standard Parts Company
OKLAHOMA CITY	Victor L. Phillips Co., 1222 West Main Street
	Wylie-Stewart Machinery Company, Inc. 1400 Exchange Avenue
PAULS VALLEY	Jackson Machine Shop
	McGee Implement Company
PERRY	Wurtz-Douglass Motor Company
SAPULPA	Sapulpa Motors, Inc., 215 S. Main Street
SEMINOLE	Magneto Ignition Company
SHAWNEE	Crawford Products Company, 320 N. Broadway
TONKAWA	Charles Jueschke Agricultural Equipment
TULSA	* Harley Sales Company, 319 Tri-State Building
WEBBERS FALLS	Conley Service Station
WOODWARD	Gilbert Maytag Company

OREGON

ALBANY	Barrett Brothers, 103 W. First Street
	Herrold & Jensen
BEND	Moty & Van Dyke
CANBY	Elmer Anderson
CORVALLIS	Corvallis Implement Company
THE DALLES	Dielschneider Equipment
	Mid-Columbia Supply & Equipment Company
EUGENE	Clark Battery & Electric
	Ed Jensen Company, Elmira Road
HILLSBORO	J. T. Foster Company
	Roy W. Heinrich
KLAMATH FALLS	Brown Equipment Company, 3049 S. 6th Street
	Crater Lake Machinery
LAKEVIEW	Brown Equipment Company
MEDFORD	Eatherton Farm Stores, 8085 Riverside
ONTARIO	Nicholson Service & Supply Company
PENDLETON	Jack Allen Supply
PORTLAND	* Andersen Machinery, 404 N. W. Broadway
PRINEVILLE	Dietz Implement
REDMOND	King Brothers Equipment
ROSEBURG	Douglas County Co-op.
SALEM	Eyerly Tractor & Implement
	A. C. Haag & Company, 40 Silverton Road
TILLAMOOK	Tillamook Implement Company, 1 East First St.
WOODBURN	Norman's Service Station

PENNSYLVANIA

ALBION	John Duda
ALIQUIPPA	Walters Farm Service, R. D. #1
ANNVILLE	Weaver's Farm Service, R. D. #1
ANSELMA	Howard White
ARENDTSVILLE	Cameron L. Hoffman
BELLEFONTE	E. J. Gentzel, R. D. #2
BELLEVILLE	Valley Sales & Service
BERNEVILLE	Stanley Klopp
BETHLEHEM	Fox Machine Shop
BIGLERVILLE	L. W. and M. S. Kleinfelter
BLUE BALL	Snavely's Farm Supply Company
BRADFORD	Bradford Supply & Equipment Company
BUTLER	Hindman Farm Supply
CAMP HILL	L. B. Smith
CARLISLE	Ernest Shover
CHAMBERSBURG	Paul Byers
CHESTER	Industrial Farm Equipment & Supply
CLEAR FIELD	Clearfield Equipment Company
COCHRANTON	John Oakes
CONNELLSVILLE	Back Creek Lumber Company
DARLINGTON (Beaver County)	F. D. Walters
DILLSBURG	Harbold's Garage
DOYLESTOWN	Paul W. Histand
EAST BERLIN	M. B. Burgard, R. D. #3
ELIZABETHVILLE	Swab Wagon Company
EPHRATA	Hamilton Equipment Co., Box 178
ERIE	Jorgenson's Garage, 1925-1929 W. 26th Street
FARMERSVILLE	Farmersville Equipment Company
GAP	Geo. Sellers & Sons
GAUGHKENAMON	Mushroom Supply Company
GILBERT	A. E. Krome
GREENCASTLE	Harry Friedly
	Meyers Implement Company
HANOVER	Sheetz Bros.
HARRISBURG	Highway Equipment Co., 840 South 19th Street
HAZLETON	Hazleton Machinery & Equipment Company
HERNDON	Wilhour Bros. Garage
HONESDALE	Geo. W. Kinsman, Main Street
HUGHESVILLE	Hughesville Machine Tool Company
INDIANA	H. D. Fair Store, 329 N. 4th Street
INTERCOURSE	Charles Hoober
JERSEY SHORE	Pepperman's Garage, R. D. #2
JERSEYTOWN	W. O. Diehl
JONESTOWN	Leroy Fake
KENNETT SQUARE	Tunis Bros. Co., Broad & Berks Streets
KINGSTON	E. F. Schmaltz, 314 Wyoming Avenue
KINZER	Arthur Young Company
KITTANNING	White's Farm Supply
KUTZTOWN	Harry Knittle
LANCASTER	* Lancaster Engineering Corporation
	L. H. Brubaker, R. R. #4
	Herr The Pump Man, 211 Ann Street
LEBANON	Elmer Plasterer, R. D. #5
LIBERTY	Liberty Garage
LITTLESTOWN	Melvin J. Sheffer, 232 N. Queen Street
MACUNGIE	Macungie Supply Company
MARTINDALE	A. W. Stauffer
McCONNELLSBURG	J. W. Snyder
McEWENSVILLE	H. R. Shearer
MEDIA	Media Lawn Mower & Equipment Company
MENDENHALL	Mendenhall Supply Company
MERCER	Mercer County Implement Company
MILLWAY	J. H. Reitz
MOUNT HOLLY	Paul's Motor Service
MOUNT JOY	J. B. Hostetter & Son
NEW HOLLAND	A. B. C. Groff
	Snavely's Farm Service
NEWPORT	A. C. Schill
NEW PROVIDENCE	Walter McVey
NORRISTOWN	Edgar E. Stem, Germantown Pike, R. D. #2
OXFORD	Oxford Auto

PALMYRA	N. J. Bashore
PARKERSBURG	Farm City Equipment Company
PHILADELPHIA *	Service Supply Corporation 20th & Venango Streets
	Emco Service, 1508 Fairmount Avenue
	Foss Contracting Equipment
	Frantz Equipment Company
	Furnival Machine Corporation
	Marine Equipment & Supply Co., 116 Walnut St.
	O'Brien Mach. Company
	Superior Equipment & Supply
PHILIPSBURG	Meyer Bros. Industrial Service Company
PITTSBURGH *	Contractors Equipment Service Company 1415 Brighton Road
PITTSTON	Medico Electric Motor Company
PORTLAND	Brands Motor Company
POTTSVILLE	Ost & Ost, 13th & Laurel Streets
READING	Berkleigh Tractor & Equipment Company 449 Lancaster Avenue
	Geo. D. Lessig & Son, 763 North 12th Street
RICHLAND	Lebanon Valley Implement Company
RONKS	Lester Singer
SANATOGA	Carl Dunmire, Route 422
SCRANTON	Scranton Tractor & Equipment Company
	Sprague & Henwood
SHARTELSVILLE	Joe Kauffman
SHIPPENSBURG	John Heberling
STEWARTSTOWN	Robert Sweeney
STOCKERTOWN	J. A. Lapresti
TOWER CITY	Tallman Bros.
TURBOTSVILLE	Cooper's Hardware
TUNKHANNOCK	Gay-Murray Company
VERONA	Oakmont Motor Supply, 733 E. Railroad Avenue
WAYNESBORO	Paul H. Stauffer, 45 E. 2nd Street
WAYNESBURG	Long Tractor Sales, Porter Street
WESCOSVILLE	B. W. Clauser, R.F.D. #1
WEST CHESTER	Bituminous Service
	Miller Welding Company
WEST WILLOW	Cope & Weaver Farm Equipment Co., Willow St.
WILLIAMSPORT	Servall Machinery & Supply, 140 E. 3rd Street
WYSOX	Robert Kneller
YORK	Burgard Bros.

RHODE ISLAND

* Diesel Engine Sales & Engineering Corp.
Fish Pier Road
Boston 10, Massachusetts

SOUTH CAROLINA

ALLENDALE	Allendale Machine Works
ANDERSON	Progressive Machine Shop
CHARLESTON	Charleston Supply Company
	Marine Shops
CHERAW	Cheraw Implement Company
COLUMBIA *	Columbia Supply Company, 823 Gervais Street
CONWAY	Eastern Sales Company
DILLON	Dillon Tractor Implement Company
FLORENCE	Turner Implement Co., Inc.
GREENVILLE	Greenville Implement Company
HARLEYVILLE	L. A. Utsey
INMAN	Prince Grove Supply
KINGSTREE	D. C. Brown Company
ORANGEBURG	Carolina Equipment Company
SUMTER	McLaurin-Nettles
UNION	Jordan Farm Supply Company
WALTERBORO	Breeland Chevrolet Company

SOUTH DAKOTA

ABERDEEN	Aberdeen Implement Company
ALCESTER	Jacobson Implement
ARLINGTON	Kneip Implement Company
ARMOUR	Armour Implement Company
ARTESIAN	Vernie Asper Implement Company
ATHOL	Kegler Implement Company
BANCROFT	Geo. A. Perry Company
BELLE FOURCHE	Belle Fourche Implement Company
BISON	Bison Service Station
BONESTEEL	Spitzenberger Implement Company
BOWDLE	J. Kurle & Sons
BRITTON	Thorp Auto Company
BROOKINGS	Eugene Beckman Implement Company
BRYANT	Matt Kruse
BURKE	McFarland Implement Company
CHAMBERLAIN	Raish Brothers Implement
DELL RAPIDS	F. N. Ginsbach
DE SMET	T. J. Williamson
EAGLE BUTTE	Eagle Butte Implement Company
ELK POINT	Busker Implement Company
FIRESTEEL	Herman's Implement Company
GARRETSON	Rademacker Implement Company
GETTYSBURG	Gettysburg Motor Company
GROTON	Berry & Werth
HECLA	Hecla Implement Company
HERRIED	Huber & Son
HOT SPRINGS	Hot Springs Implement Company
HOVEN	A. J. Herrick
IPSWICH	Wall Implement Company
IROQUOIS	Salter & Schoenfelder
ISABEL	Isabel Trading Post
LAKE PRESTON	Kiel Implement Company
LEMMON	Krischen Implement Company
LEOLA	Becker Implement Company
McINTOSH	Peterson Implement Company
MANSFIELD	Koester Implement Company
	Wiltfang Brothers
MILBANK	Milbank Implement Company
MORRISTOWN	Ed Kouril Implement Company
NEW EFFINGTON	Bredvik Implement Company
NORTHVILLE	Haselhorst Implement Company
ONIDA	Day Implement Company
PIERRE	Wegner Auto Company
RAPID CITY	S. Dak. Equipment Company
REE HEIGHTS	Max Curtis Service Station
ROSHOLT	Warner Implement Company
SELBY	Rabensberg Implement Company
SIOUX FALLS *	Pecaut Industrial Supply Company 900 E. 8th Street
	General Mills, Inc.
	West Sioux Falls Hardware
SISSETON	Dakota Equipment Company
SPEARFISH	Spearfish Implement Company
TIMBER LAKE	Hulm Implement Company
VERMILLION	Swenson & Donahue
WATERTOWN	Hubbard & Company
WEBSTER	Harry C. Walker & Company
WILMOT	Porter Chevrolet Company
YANKTON	Cowman & Hicks

TENNESSEE

ALAMO	Byrd Implement Company
ATHENS	Dixie Motor Company
	Hart's Automotive Parts Company
BRISTOL	Maden Motors, Inc., Cumberland & Lee Streets
CHATTANOOGA *	Hart's Automotive Parts Company 1250 Market Street
	Brooks Equipment & Mfg. Company
	Brooks Welding Supply Company, 1201 Chestnut St
	Hailey Chevrolet Company
	Nixon Machinery & Supply
	Osborne Equipment Company
CLARKSVILLE	Black Patch Implement Company
	Williams Motor Company

CLEVELAND	Bell Tractor Company
	Hart's Automotive Parts Company
	McMinn Supply Company
	Fred Robinson Implement Company
	Smith Tractor Company
COLUMBIA	Farmer's Implement Company
COOKEVILLE	Dunn's Auto Parts Company
COPPERHILL	Copperhill Auto Supply Company
COWAN	R. H. Brock & Company
CROSSVILLE	Plateau Truck & Equipment Company
DAYTON	Fritts & Garrison Motor Company
DUNLAP	Barker's Service Station
DYERSBURG	Tri-County Equipment Company
ERWIN	Erwin Auto Parts Company
ETOWAH	Etowah Welding Company
FAYETTEVILLE	Rambo Motor Company
	Yearwood Motor Company
FRANKLIN	Warren Farm Service
GREENVILLE	J. S. Beuford Supply Company
	Iddins Machinery Company
HALLS	Halls Grain Company
HARRIMAN	Browder Motor Sales
	Christmas Lumber Company
	Hart's Automotive Parts Company
	Western Auto Associate Store
JACKSON	Wilson Welding Company
JAMESTOWN	Beatty Motor Company
JASPER	Marion County Motor Company
JOHNSON CITY	Automotive Electric Company, 214 W. Market St.
	Thorpe Auto Parts Company
	Young Supply Company
KINGSPORT	Mills Motor Company
KNOXVILLE	Brooks Equipment & Mfg. Company
	Iddins Machinery Company
	Osborne Equipment Company
	Power Equipment Co., 1218 Island Home Avenue
	Wilson, Weesner & Wilkinson, 202 W. Morelia Ave.
LaFOLLETTE	Campbell County Sales Company
	Motor Grinding Company
LAWRENCEBURG	Niedergesis Bros.
MANCHESTER	Coffee County Implement Company
MARYVILLE	Hart's Automotive Parts Company
	Veal Motor Company, E. Broadway
McMINNVILLE	Slatton Implement Company
MEMPHIS	* Lewis Diesel Engine Company, Main at Butler
	Choctaw, Inc.
	Clarkkey Company
	Hawkins Equipment Company
	Hurley Tractor Company
	Tri-State Equipment Company
	Weakley Equipment Company
MORRISTOWN	Morristown Equipment Company
MURFREESBORO	McFarland's Farm Implement Company
NASHVILLE	Industrial Supply Company, 420 LaFayette St.
	McCarthy, Jones & Woodland
	Nashville Warehousing Company
	Nixon Machine & Supply Company
	Wilson-Weesner-Wilkinson Company
NEWPORT	W. R. Neas & Company
OOLTEWAH	Fred Robinson
OLIVER SPRINGS	Oliver Springs Auto Supply
PARIS	Chenoweth Implement Company
PULASKI	Abernathy Grain & Feed Company
RIPLEY	Morris Farm Equipment & Supply Company
ROCKWOOD	White's Auto Parts
SELMER	Selmer Implement Company
SHELBYVILLE	Farm Service Supply Company
SOUTH PITTSBURG	J. D. Heiskell
SPRINGFIELD	Long & Lucas Implement Company
SUNBRIGHT	England Motor Company
SWEETWATER	Guthrie Bradley & Jones
	Valley Motors, Inc.
TULLAHOMA	England Motors
UNION CITY	Jackson Implement Company
WINCHESTER	Brazelton Motor Company
	Franklin County Motor Company
	Rieben Electric & Machinery Company

TEXAS

ABILENE	Bud Mitchell Garage, 817 Walnut
ALICE	Lynn Bros. Garage
AMARILLO	Overton & Mims, Inc., 713 E. 10th Street
	Radcliff Bros. Electric Co., 3rd & Buchannon St.
AUSTIN	Austin Machine & Grinding Company
	219 East 5th Street
BALMORHEA	Sprague's Auto, Truck & Tractor Service
BEAUMONT	Simmonds Motor & Machine Company, 380 Pine St.
BONHAM	Brown Tractor Company
	Teel Maintenance Service, 1280 S. 4th Street
BRADY	A. H. Broad Company
BRENHAM	Brentex Tractor Company
BROWNSVILLE	Delta Machine Company
CISCO	The Walton Electric Company
CLEBURNE	Zimmerman & Sons Company
COLORADO CITY	Diesel Service Company, 242 W. 4th Street
CORPUS CHRISTI	C. E. Russell, Jr., 104 S. Chaparral Street
DALLAS	Conley-Lott-Nichols Machinery Company
	1311 S. Ervay Street
	P. A. Ross Machinery Company, 2703 Main Street
DONNA	Bell Hardware & Implement Company
EDINBURG	Cameron Auto Electric Co., 501 E. Harriman St.
	Equipment Specialties Co. Inc., 222 No. Closner
EL PASO	Tri-State Equipment Company
	Francis Wagner Company, 1225 Texas Street
ENNIS	Ennis Tractor Company, 300 West Brown
FORT WORTH	Willis Lee Air-Cooled Engine Service
	414 West Weatherford Street
	The Jno. Muller Company, 2nd & Taylor Streets
FREDERICKSBURG	Fredericksburg Machine Shop
GAINESVILLE	S & H Supply Company, Box 579
HARROLD	R. H. King Supply Company
HILLSBORO	Weatherby-Davis Company, 200 S. Waco Street
HOUSTON	* Harley Sales Company, M & M Building
KILGORE	The Jno. Muller Company
	Sabine Machine & Supply Company
LaGRANGE	Janssen Bros.
LAMESA	Shepherd Battery & Electric Co., 213 No. 1st St.
LAREDO	Laredo Implement Company, 509 Market Street
LEVELLAND	Waters-Glover Battery & Electric Company
	410 East Houston Street
LONGVIEW	Industrial Power & Supply Co.
	1220 Gladewater Road
LUBBOCK	Fred Berryhill Equipment Co., 710 Avenue "Q"
MARSHALL	Power Supply Company, 208 Lafayette
McALLEN	Cameron Auto Electric Service, 917 Austin St.
	J. E. Morgan Company, 501 East Hiway
McKINNEY	City Auto Parts Company, So. Chestnut at Davis
ODESSA	Davenport Engine & Equipment Co., 212 N. Lincoln
PAMPA	Radcliff Bros. Electric Company, Box 151
PARIS	R. H. Deaton Tractor Co., 257 First St. S.W.
PERRYTON	Davis Implement Company
	S.E. 8th Avenue & S.E. 1st Street
PORT ARTHUR	Sabine Propeller & Marine Service
	West Lakeshore Drive
ROCKPORT	Rice Boat Company
SAN ANGELO	San Angelo Supply Company, 408 S. Oakes St.
SAN ANTONIO	Gibtrac, Inc., Highway 281 & S. Flores Street
SAN SABA	W. T. Vogel & Sons
SANDERSON	O. T. Sudduth
SHERMAN	Clark Equipment Company
STEPHENSVILLE	John Wilkins Implements
STONEWALL	Simon J. Burg Sprayer Company
TEMPLE	Laramey Implement Company
TEXARKANA	Texarkana Machinery Company
WAXAHACHIE	C. R. Feaster & Company

WACO	The Motor Shop, 420 South 5th Street
	Richards Equipment Co., 4th & Washington

UTAH

BRIGHAM CITY	Anderson Auto Company
	H. R. Bott, 132 N. Main Street
	Brigham Truck & Implement Company
CEDAR CITY	Chas. Hunter - Cedar Furniture & Hardware Co.
CIRCLEVILLE	Kenz Service
HURRICANE	Judd Mercantile Company
LAYTON	Golden F. Layton Farm Implements
LEHI	L. O. Peterson Implement Company
LOGAN	Homer Tractor Company, 36 S. Main Street
	Kowallis Hardware & Implement
	Petersen Tractor Service, 503 N. Main
OGDEN	Weber Tractor & Implement
OREM	Modern Farm Service
SALINA	Sevier County Tractor Company
SALT LAKE CITY	* Arnold Machinery Company, Inc. 433 West Second South Street
SPRINGVILLE	G. Lowry Anderson, Inc.
TREMONTON	Lilenquist Brothers

VERMONT

BARRE	Marsh-Allen Company
BRATTLEBORO	Bemis Tractor & Implement Company

* Diesel Engine Sales & Engineering Corp.
Fish Pier Road
Boston 10, Massachusetts

VIRGINIA

ALEXANDRIA	* Phillips Machinery & Tractor Company P. O. Box 549
CHARLOTTESVILLE	H. M. Gleason & Company
CROZET	Piedmont Tractor Company, Inc.
CULPEPER	J. A. Swan, Jr. & Co.
FRANKLIN	G. H. Steinhardt & Company 2nd Avenue & Mechanics Street
FREDERICKSBURG	Collins Farm Equipment Company 1919 Princess Anne Avenue
	A. W. Mitchell, Prince Edward & Wolf Streets
GALAX	Felts Pontiac Sales, 121 W. Grayson Street
	Twin County Motor Company, 306 N. Main Street
GRETNA	Gretna Tractor & Implement Company
HARRISONBURG	Whitesel Brothers
LYNCHBURG	Farm Service Company, 1213 Church Street
	Myers & Rhokes Equip. Co., 1612 Main Street
NEWPORT NEWS	W. L. Gleason Co., 3511 Jefferson Avenue
NOKESVILLE	W. E. Herring
NORFOLK	Bell Equipment Company, 919 W. 21st Street
	Industrial Service Co., 1532 E. Princess Anne Rd.
	Land & Coates, Inc., 3301 Virginia Beach Blvd.
NORTON	Norton Motor Inn
ORANGE	Gill Farm Machinery Company
	Waugh-Young Equipment Company
PETERSBURG	Ritchie's Hardware Company
RICHMOND	* Phillips Machinery Company, 929 Meyers Street
	Buhrman & Sons, Inc., 1438 E. Franklin Street
	Producers Co-Operative Exchange, Inc. 1438 E. Main Street
ROANOKE	Baker Bros., 3213 Williams Rd.
	Growers & Producers Exchange, 702 First St. S.E.
SOUTH BOSTON	Boston Machine & Foundry Company
STANLEY	Louderback's Implement Company, Route #1
STAUNTON	S. Chester Slade
SUFFOLK	Suffolk Equipment Company, 1525 Main Street
TAZEWELL	Tazewell Equipment & Motor Corp.
WAKEFIELD	Dudley S. Robertson
WINCHESTER	Shade Equipment Company
WYTHEVILLE	R. P. Johnson

WASHINGTON

ABERDEEN	Grays Harbor Equipment Company
	Whitcher Machinery Company, 411 E. State St.
ALMIRA	Frenn Motors
BELLINGHAM	Automotive Parts Service, 1322 State Street
BREMERTON	Williamson's Machine Shop, 2612 Burwell
BURLINGTON	Johnson-Barclay Implement
CHEHALIS	Graham Implement Company
ELLENSBURG	Frank Haagen & Son, 202 North Pine
EVERETT	Everett Marine Sales & Serv., 1202 Hewitt Ave.
	Mulligan Implement Company, 2401 Hewitt Ave.
EVERSON	Everson Implement Company
FERNDALE	Fassett & Barr
FORKS	Ulin Maintenance & Supply
LYNDEN	Van's Hardware & Sheet Metal
MONTESANO	Whitney's Farm Store
MOSES LAKE	C. B. Supply Company
MT. VERNON	Bert Robinson Implement, 315 Main Street
MOXEE CITY	Moxee City Warehouse
OLYMPIA	Andrews Auto Parts
PASCO	Gunther Tractor
PORT ANGELES	Olympic Packard Company, 226 East First
	Ulin Maintenance & Supply
PROSSER	Valley Hay & Implement
PULLMAN	Pullman Tractor Company
PUYALLUP	Ray Bock Equipment Company 11th N. W. at River Road
SEATTLE	* Star Machinery Company, 1741 First Avenue, S.
	A. H. Cox & Company, 1757 First South
SPOKANE	* Star Machinery Company, East 415 Sprague Ave.
	Andrews Equipment Service
	Brende Machinery Company
SUMNER	Sumner Farmers Supply, 823 Main
SUNNYSIDE	Valley Hay & Implement Company
TACOMA	Motor Parts & Equipment Co., 1745 Jefferson
	Service Hdwe & Implement, 1545 East Bay
WALLA WALLA	Industrial Products Company
	Melcher-Ray Machinery Company, 202 E. Alder
WENATCHEE	Wells & Wade
YAKIMA	Rankin Equipment, 1010 So. First

* Andersen Machinery
404 N. W. Broadway
Portland, Oregon

WEST VIRGINIA

CAMERON	Cameron Tool & Supply Company
CHARLESTON	* West Virginia Tractor & Equipment Company
	Peoples Supply
CLARKSBURG	West Virginia Tractor & Equipment Company
	* Contractors Equipment Service Company 1415 Brighton Road Pittsburgh, Pennsylvania

WISCONSIN

ANTIGO	Gresch Implement Company
APPLETON	Art F. Fuerst Implement Company
ARCADIA	Arcadia Motor Supply
BLACK EARTH	Capitol Farm Equipment & Supply
BLOOMER	Farmers Store Company
BURLINGTON	Fohr & Leiden
COLUMBUS	Columbus Implement Company
DARIEN	Wilke-Darien Garage
DeFOREST	DeForest Implement Company
EAU CLAIRE	Eau Claire Implement Company
ELKHORN	Opitz Implement Company
ELLSWORTH	Finstad Implement Company

FOOTVILLE	Footville Implement Company
FOREST JUNCTION	Keller Implement Company
GREEN BAY	Brebner Machinery Company
INGRAM	Kaiser Implement Company
JUDA	Carter & Gruenwald Implement Company
LAKE BEULAH	Ells Bros. Farm Implement Company
LANCASTER	Gurkow Produce
MANITOWOC	Seibold Implement Company
MARATHON	Gertschen Implement Company
MILWAUKEE	* Engine Power, Inc., 4320 N. 35th Street
MONROE	Studer Super Service
NEW GLARUS	Disch Hardware
OREGON	Lappley Fuel & Implement Company
POTOSI	Andrew Bode Company
RHINELANDER	Newbold Machinery Company
SAUK CITY	Sauk Implement Company
STURGEON BAY	Husby & Laubenstein
SUN PRAIRIE	Hanley Implement Company
TOMAH	George Von Haden Implement
VALDERS	Seibold Implement Company
VIOLA	Kellogg Implement Company
WHITEWATER	Engel Implement Company
WISCONSIN RAPIDS	Central Electric Service

WYOMING

AFTON	Austin Tractor & Implement
CHEYENNE	Wortham Machinery Company
SHERIDAN	Valley Motor & Implement Company
TORRINGTON	Sherling Auto Electric Company
WHEATLAND	Valley Implement Company

* Arnold Machinery Company, Inc.
  433 West Second South Street
  Salt Lake City, Utah
* Central Supply Company
  12th & Lincoln
  Denver, Colorado
* Midland Implement Company, Inc.
  Billings, Montana

FOREIGN

AFRICA

ALGERIA	* Ets. Henry Hamelle 27, Boulevard Carnot, Alger
	* Ets. Henry Hamelle 4, Rue de l'Artillerie, Oran
BELGIAN CONGO	* Bureau Technique Bia Boite Postale 729, Elisabethville
	* Bureau Technique Bia 26 Avenue Paul Hauzeur, (B.P. 301) Leopoldville
EGYPT	* Mr. Artine Spendjian P. O. Box 1505, Alexandria
	* Mr. Artine Spendjian 15, Rue Emad el Dine, Cairo
FRENCH MOROCCO	* Ets. Henry Hamelle 47, Avenue Poeymirau, Casablanca
FRENCH WEST AFRICA	* Ets. Henry Hamelle 50, Rue Gambetta, Dakar
MOZAMBIQUE	* Johnson & Fletcher, Ltd. P. O. Box 196, Beira
NORTHERN RHODESIA	* Johnson & Fletcher, Ltd. P. O. Box 123, Ndola
SOUTHERN RHODESIA	* Johnson & Fletcher, Ltd. P. O. Box 224, Bulawayo
	* Johnson & Fletcher, Ltd. P. O. Box 118, Gatooma
	* Johnson & Fletcher, Ltd. P. O. Box 588, Salisbury
	* Johnson & Fletcher, Ltd. P. O. Box 186, Umtali
SOUTH AFRICA	* Thos. Barlow & Sons (Natal) Ltd. P. O. Box 1011, 365 Smith Street Durban
	* Thos. Barlow & Sons (S.A.) Ltd. 7, Simmonds Street, P. O. Box 6901 Johannesburg
	* Barlow's (Cape) Ltd. P. O. Box 84 Voortrekker Road, Maitland, Cape
	* Barlow's (Eastern Province) Ltd. 63, Grahamstown Road, Port Elizabeth
TUNISIA	* Ets. Henry Hamelle 58, Avenue de Carthage, Tunis

ALASKA

ANCHORAGE	Northern Commercial Company Yukon Equipment, Inc.
FAIRBANKS	Northern Commercial Company Yukon Equipment, Inc.
JUNEAU	Northern Commercial Company Chas. G. Warner Company
KETCHIKAN	Tongass Trading Company
PETERSBURG	Fryer Machine Works

* Star Machinery Company, 1741 First Avenue, S
  Seattle, Washington - U. S. A.

ARGENTINA

BUENOS AIRES	* Storer & Cia. Soc. Resp. Ltda. Chacabuco 443

AUSTRALIA

RYDALMERE, N.S.W.	* Tutt Bryant Ltd.

BELGIUM

BRUXELLES	* Societe Belge de Materiel Automobile 157, rue de Hal in Brussels-Forest

BOLIVIA

LA PAZ	* Industrial Agencies (Bolivia) Ltda. P. O. Box 718
ORURO	* Industrial Agencies (Bolivia) Ltda. P. O. Box 430

BRAZIL

RIO de JANEIRO	* Luiz F. Braga & Filhos Av. N. S. de Fatima 22-3

BRITISH HONDURAS

BELIZE	* The Belize Supply Co., Ltd. P. O. Box 272

BRITISH WEST INDIES

JAMAICA	* Masterton, Limited 23-25 Hanover Street, P. O. Box 73 Kingston
TRINIDAD	* Industrial Agencies Limited, 14 High Street San Fernando

CANADA

ALBERTA

CALGARY	* Bruce Robinson Electric Ltd. 9th Avenue & 4th Street, West
EDMONTON	The Bruce Robinson Electric, Ltd. 10123, 102nd Street

BRITISH COLUMBIA

VANCOUVER	* Pacific Engines & Equipment, Ltd. 48 E. Cordova Street

MANITOBA

WINNIPEG	* Mumford-Medland, Ltd., 576 Wall Street

NEW BRUNSWICK

FREDERICTON	* J. Clark & Son Limited 123 York Street

NEWFOUNDLAND

CORNER BROOK	Newfoundland Tractor & Equipment Co., Ltd. P. O. Box 683
ST. JOHN'S	* Newfoundland Tractor & Equipment Co., Ltd.

NOVA SCOTIA

HALIFAX	* Construction Equipment Company, Ltd. P. O. Box 67, 135 Lower Water Street
NEW GLASGOW	Spencer Motors, Limited
SYDNEY	Industrial Div., Atlantic Spring & Machine Co., Ltd.
YARMOUTH	Yarmouth Motors, Limited

ONTARIO

BARRIE	Torgis Automotive Limited, 39 High Street
BRANTFORD	Brant Feed & Supplies Limited 243 Colborne Street
CLINTON	McAlpine & Daw
DUNNVILLE	Cowan & Lymburner
FORT WILLIAM	The Northland Machy. Supply Company, Ltd.
HAMILTON	Contractors Machy. & Equipment Limited 194 Barton Street East
KINGSTON	David M. Nesbitt Motors, 903 Princess Street
KIRKLAND LAKE	Northland Sales & Service, Towers Street
KITCHENER	Waterloo Co-op., 60 Frederick Streets 203 Hardisty Street
LONDON	E. P. Abey, Wharncliffe Road, South
NEW TORONTO	* Consolidated Engines & Machy. Company, Ltd. 14th & Birmingham Streets
NORTH BAY	Northland Equipment & Supply Company 621 Main Street, West
OTTAWA	Mechron Engineering Products 165 Echo Drive
PETERBOROUGH	Pilon Marine Sales & Service, 176 Simcoe St.
PORT ARTHUR	Thornes-Sargent, Jobbers-Distributors Violet Street
SAULT STE MARIE	Soo Equipment Limited, 54 Tancred Street
SMITH FALLS	Clark & Lewis
SUDBURY	Duncan Brothers Limited, 84-86 Cedar Street
TIMMINS	Harnden & Newell Ltd., 70 Pine St., S.
TRENTON	Quinte Machine & Repair Co., Balsam Street
WINDSOR	C. H. Henze Company, Ltd., 620 Glengarry Ave.

QUEBEC

CHICOUTIMI	Saguenay Industrial Supplies, Ltd. 179 Jacques Cartier Street
MONTREAL	* Consolidated Engines & Mchry. Company, Ltd. 1822 St. Catherine St., West
QUEBEC	Rene Talbot Limited, 205 St. Paul Street
PLESSISVILLE	Forano, Limited
ROUYN	Lariviere Brothers, 32-38 Rue Principale
SHERBROOKE	La Societe Cooperative Agricole de Sherbrooke, 43 Lansdowne Avenue
VICTORIAVILLE	La Fonderie Universel Engr.

SASKATCHEWAN

REGINA	Gregg's Machy. Exchange 6th Avenue at Halifax Street
	Robinson Machinery Company The Saskatchewan Federated Co-Operatives, Ltd 1150 Rose Street
SASKATOON	Mumford-Medland, Ltd., 521 - 1st Avenue, N. The Saskatchewan Federated Co-Operatives, Ltd 12 - 23rd Street, East

CHILE

CONCEPCION	Sociedad Importadora del Pacifico Ltda. Casilla 785
SANTIAGO	* Sociedad Importadora del Pacifico Ltda. Alameda Bernardo O'Higgins 1166 Casilla 82-D
VALPARAISO	Compania Comercial De Valparaiso, S.A. Cockrane 719

COLOMBIA

BARRANQUILLA	* Peter Santa Maria & Cia. Ltda. Almacen Universal, Calle 37, No. 44-116, Apartado Aereo No. 854
BOGOTA	"La Electrotecnica" Calle 13, Numero 19-57 Apartado Aereo 3712
CALI	* Peter Santa Maria & Cia. Ltda. Almacen Universal, Calle 25, No. 7-60, Apartado Aereo No. 1210
MEDELLIN	* Peter Santa Maria & Cia. Ltda. P. O. Box 910 (Also Cali and Barranquilla)

COSTA RICA

SAN JOSE	* Costa Rica Machinery Company, Inc. P. O. Box 1328

CUBA

HAVANA	* Armando J. Valdes & Cia. Ingenieros Importadores, S.A. Fabrica No. 13, P. O. Box 824

DOMINICAN REPUBLIC

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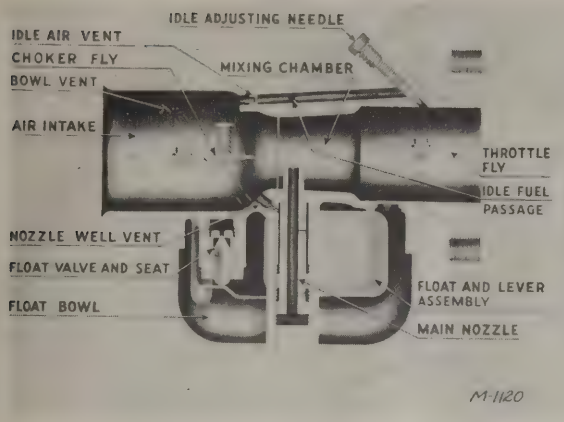
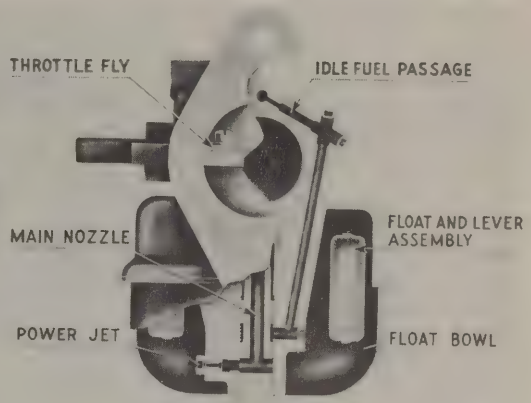
MARVEL-SCHEBLER CARBURETER

FOR WISCONSIN MODELS VM4 AND VP4 ENGINES





DESCRIPTION

1. The Model VH-(Wis. No. L-54-Etc.) is a float type carbureter with idle fuel adjustment designed for use with the Models VM-4, VP-4 Wisconsin Air Cooled gasoline engines, and is made up of two major units — a die cast aluminum throttle body and a stamped steel fuel bowl.
2. The model number is stamped on a square boss, provided for it on the body casting.

OPERATION

With the throttle fly slightly open from the closed position to permit idling, the main fuel nozzle may be delivering little or no fuel, as only a very small quantity of air passes through the mixing chamber at this time. An idle passage is provided to carry sufficient air and fuel to the engine side of the throttle fly where the suction is high. This passage takes the air from the inlet side of the venturi to the intersection of the vertical idle fuel passage (which connects with the main nozzle assembly) and delivers the air-fuel mixture through an opening controlled by the idle adjusting needle to the throttle barrel just beyond or on the engine side of the throttle fly. The idle system is practically independent of the main nozzle system, and only controls the fuel metering at low engine speed. As airflow increases with the opening of the throttle fly the main nozzle begins to deliver fuel, and the delivery from the idle system decreases until at full throttle, delivery is entirely from the main nozzle.

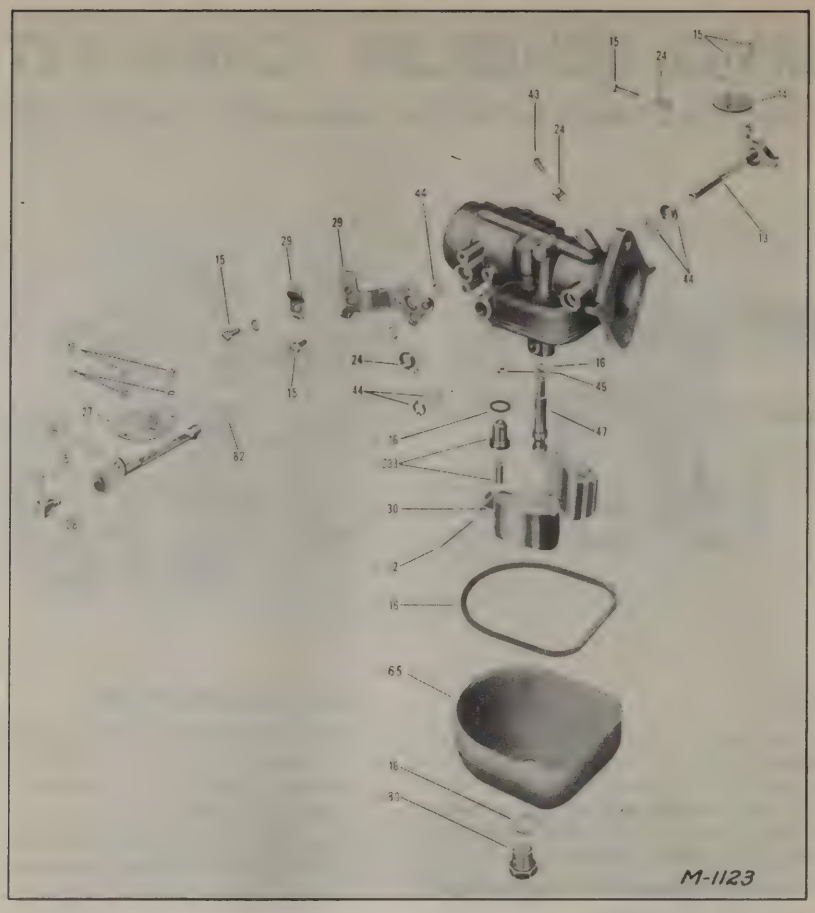
ADJUSTING CARBURETER

1. To start the engine, close the choker fly. When the engine starts, open choker to the proper warm-up position. After engine has warmed up open choker fully.
2. Close the throttle and adjust the throttle stop screw to give the proper idle speed. The idle adjusting needle should be in proper adjustment at about ¾ to 1 turn open. Turn the idle adjusting needle open until engine rolls from "richness". Then turn the needle towards the seat until the engine runs irregularly from "leanness". From the "lean" setting, open the idle adjusting needle to the richest mixture that will not cause the engine to "roll" or run unevenly. This adjustment will, in most cases, give a slower idling speed than a slightly leaner adjustment with the same throttle stop screw setting, but will give the smoothest idle operation. After the idle adjusting needle setting has been made, it may be necessary to revise the throttle stop screw setting to give the proper idling speed.

CAUTION:

Care should be taken not to damage the idle adjusting needle nor its seat by turning the idle adjusting needle too tightly against the seat, as damage to either of these parts will make a satisfactory idle adjustment very difficult.

MARVEL-SCHEBLER CARBURETER DIVISION, BORG-WARNER CORPORATION
FLINT, MICHIGAN, U. S. A.



SERVICE PARTS LIST

SYMBOL NO.	PART NAME - DESCRIPTION	L-54 VH-16	L-54-D VH-20	L-54-B VH-22	L-54-C VH-23	L-54-F VH-30	L-54-J VH-45	L-54-K VH-49
10	Carburetor Assembly Complete	10-2855	10-2950	10-2964	10-2980	10-3111	10-3396	10-3398
13	Throttle Shaft Assembly	13-919	13-956	13-948	13-919	13-980	13-956	13-980
14	Throttle Fly	14-214	14-214	14-214	14-214	14-214	14-214	14-214
15	Screw (#8-32 x 3/4" Fill. Head) (Throttle Stop)	15-42	15-42	15-42	15-42	15-85	15-42	15-85
15	Screw (#8-32 x 5/16" Fill. Head) (Choke Brkt., Swivel)	15-285	15-285	15-285	15-285	15-285	15-285	15-285
15	Screw (#4-40 x 1/4") (Sems) (Throttle Fly)	15-A46	15-A46	15-A46	15-A46	15-A46	15-A46	15-A46
15	Screw (#4-40 x 3/16") (Sems) (Choke Fly)	15-A47	15-A47	15-A47	15-A47	15-A47	15-A47	15-A47
15	Screws (Sems) (#8-32 x 3/8" Fill. Head) (Choke Bracket)	.....	15-A93	15-A93	.....	15-A93	15-A93	15-A93
16	Gasket (Bowl Plug - 1) (Float Valve Seat - 1)	16-4	16-4	16-4	16-4	16-4	16-4	16-4
16	Gasket (Nozzle)	16-456	16-456	16-456	16-456	16-456	16-456	16-456
16	Gasket Assortment	16-649	16-649	16-649	16-649	16-649	16-649	16-649
16	Gasket (Bowl)	16-A105	16-A105	16-A105	16-A105	16-A105	16-A105	16-A105
	Spring (Power Adjusting Needle) not illustrated	.....	.....	.....	.....	24-A1	.....	24-A1
24	Spring (Choke Return)	24-A107	24-213	24-213	24-A107	24-213	24-213	24-213
24	Spring (Throttle Adj.)	24-262	24-262	24-262	24-262	24-262	24-262	24-262
24	Spring (Idle Adj. Needle)	24-485	24-485	24-485	24-485	24-485	24-485	24-485
26	Choke Shaft Assembly	26-711	26-720	26-720	26-711	26-720	26-720	26-720
27	Choke Fly Assembly	27-559	27-559	27-559	27-559	27-559	27-559	27-559
28	Choke Swivel	28-49	28-49	28-49	28-49	28-49	28-49	28-49
29	Choker Bracket Assembly	.....	29-537	29-537	.....	29-537	29-537	29-537
30	Float & Lever Assembly	30-666	30-666	30-666	30-666	30-666	30-666	30-666
32	Float Lever Shaft	32-27	32-27	32-27	32-27	32-27	32-27	32-27
43	Idle Adjusting Needle	43-129	43-129	43-129	43-129	43-129	43-129	43-129
	Power Adjusting Needle Assembly - not illustrated	.....	.....	.....	.....	43-606	.....	43-606
44	Packing (Choke Shaft - 1) (Throttle Shaft - 2)	44-38	44-38	44-38	44-38	44-38	44-38	44-38
47	Main Nozzle	47-300	47-300	47-300	47-300	47-311	47-300	47-311
49	Power Jet	49-279	49-283	49-283	49-283	.....	49-224	.....
55	Cup (Choke Shaft - 1)	55-230	55-230	55-230	55-230	55-230	55-230	55-230
55	Packing Retainer (Throttle Shaft - 2)	55-231	55-231	55-231	55-231	55-231	55-231	55-231
60	Bushing (Throttle Shaft)	60-439	60-439	60-439	60-439	60-439	60-439	60-439
65	Fuel Bowl	65-172	65-172	65-172	65-172	65-700	65-172	65-700
80	Plug - Bowl Retaining	80-166	80-166	80-166	80-166	80-166	80-166	80-166
82	Cotter (Choke Swivel)	82-16	82-16	82-16	82-16	82-16	82-16	82-16
233	Matched Float Valve, Seat and Gasket Assembly	233-536	233-536	233-536	233-536	233-536	233-536	233-536
286	Package Repair Kit	286-756	286-776	286-777	286-756	286-831	286-776	286-831

WICO MODEL XH-4 MAGNETOS

FOR WISCONSIN MODELS VE4, VF4, VM4 AND VP4 ENGINES

INSTRUCTIONS

TIMING

The magneto is properly timed to the engine at the factory. If it becomes necessary to retime the magneto to the engine, refer to the diagram and instructions in the engine instruction book.

LUBRICATION

The only lubricating point in the magneto is the cam wiper felt, 5077. This felt, which lubricates the breaker arm at point of contact with the cam, should be replaced whenever it is necessary to replace the breaker contacts.

IMPORTANT

Incorrectly adjusted spark plug gaps cause magneto failure more frequently than any other condition.

Spark plugs should be inspected at frequent intervals, the size of the gap should be carefully checked and adjusted and the plugs thoroughly cleaned.

All oil, grease, and dirt should frequently be wiped off the magneto, lead wires, and spark plug insulators. Keeping these parts clean and the spark plugs properly adjusted will improve the engine performance and at the same time will prolong the life of the magneto.

DISTRIBUTOR CAP AND ARM

The distributor cap, X5653, may be removed by loosening the 3 screws, 5622, which hold it in place. The distributor arm, X5331, can then be removed from the shaft. When replacing the distributor arm be sure that the flat inside of the arm is lined up with the flat on the cam.

BREAKER CONTACTS - REPLACEMENT AND ADJUSTMENT

The breaker contacts should be adjusted to .015" when fully opened. To adjust the contacts, loosen the two clamp screws 5900, enough so that the contact plate can be moved.

Insert the end of a small screw driver in the adjusting slot and open or close the contacts by moving the plate until the opening is .015", measuring with a feeler gauge of that thickness, tighten the two clamp screws.

To replace the contacts remove the breaker, the spring clamp screw, 6017, the breaker arm lock and washer, 3219, and 4210, then lift the breaker arm from its pivot. Remove the spacing washer, 5717, and the two breaker plate clamp screws. 5900. The breaker plate can then be removed.

If the contacts need replacing it is recommended that both the fixed contact and the breaker arm be replaced at the same time, using replacement breaker set X5996.

After assembly the contacts should be adjusted as described above. The contacts should be kept clean at all times. Lacquer thinner is an ideal cleaner for this purpose. Use WICO tool S-5449, to adjust the alignment of the contacts so that both surfaces meet squarely.

CONDENSER

To remove the condenser, X5614, first disconnect the condenser lead by removing the breaker arm spring screw, 6017, then remove the two condenser clamp screws, 5411, and the condenser clamp 5532. When replacing the condenser make sure it is properly placed between the two locating bosses and that the clamp screws are securely tightened.

COIL AND COIL CORE

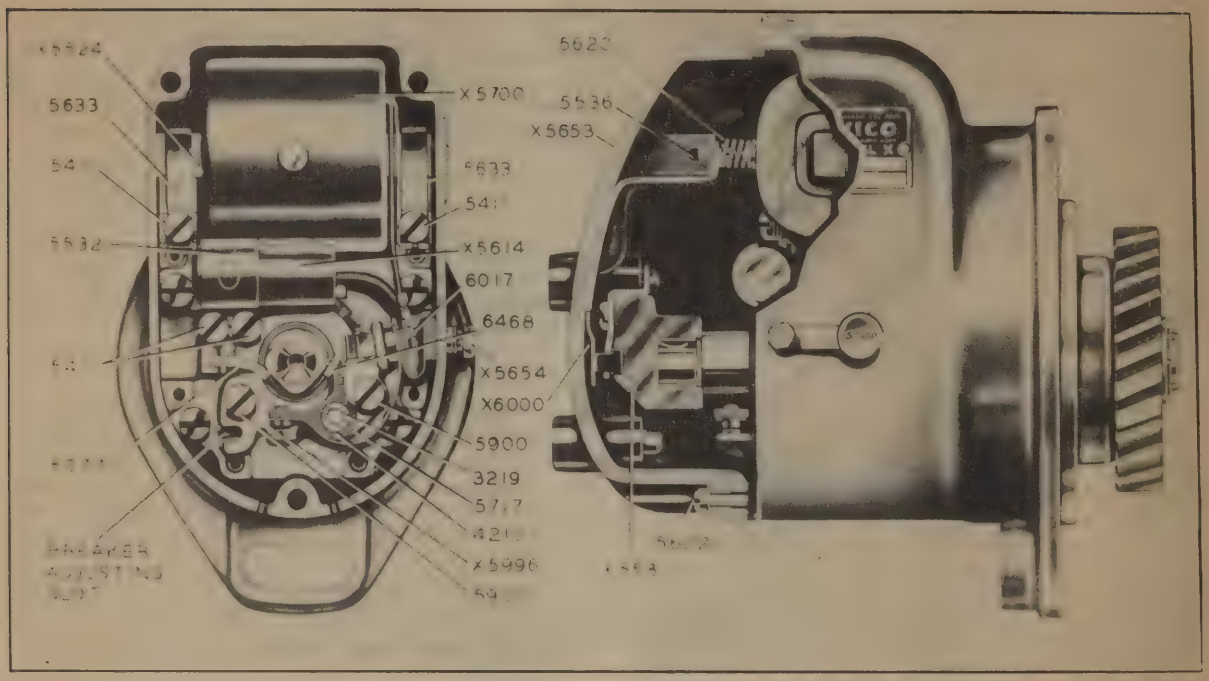
The coil and coil core must be removed from the magneto housing as a unit. After the distributor cap, distributor arm, and breaker shield have been removed and the primary wire disconnected from the breaker arm spring terminal by removing screw 6017, take out the two coil core clamp screws, 5411, and remove the clamps 5633. The coil and core can then be pulled from the housing. When replacing this group make sure that the bare primary wire is connected under the core clamp screw and that the insulated wire is connected to the breaker arm spring terminal.

REMOVAL OF COIL FROM CORE

The coil X5700, is held tight on the core, X5524, by two wedges, 10383. It will be necessary to press against the coil core with considerable force to remove it from the coil. The coil should be supported in such a way that there is no danger of the primary of the coil being pushed out of the secondary.

When replacing the coil on the coil core, slide it on then press in the two coil wedges, one on each end, until they are flush with the primary of the coil.

WICO MODEL XH-4, Nº XH-1343 MAGNETO
WIS. MOTOR Nº Y-54



PART NO.	PART NAME
3219	Breaker arm pivot washer
4210	Breaker arm lock
5077	Cam wiper felt
5411	Condenser clamp screw
5411	Coil core clamp screw
X5524	Coil core group
X5531	Distributor arm group
5532	Condenser bracket
5536	Coil contact screw
X5614	Condenser group
5620	Coil contact spring
5622	Distributor cap screw
5633	Coil core clamp

PART NO.	PART NAME
X5653	Distributor cap unit (Includes 6081)
X5654	Ground connection unit
X5700	Coil group
5717	Breaker contact aligning washer
5900	Fixed contact clamp screw
X5996	Breaker contact set (Includes fixed contacts, breaker arm)
X6000	Secondary interlead group
6017	Breaker spring clamp screw
6081	Distributor cap gasket
6468	Breaker arm felt

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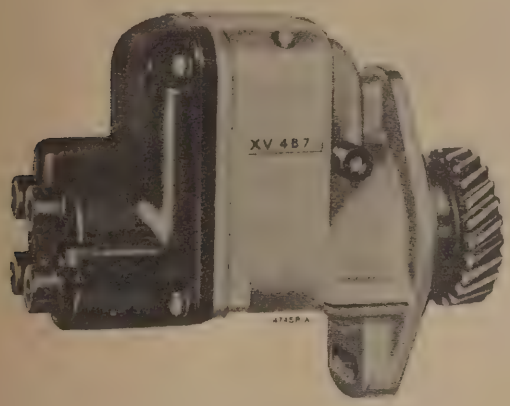
Instructions No. 2907B

Supersedes Instructions No. 2907A

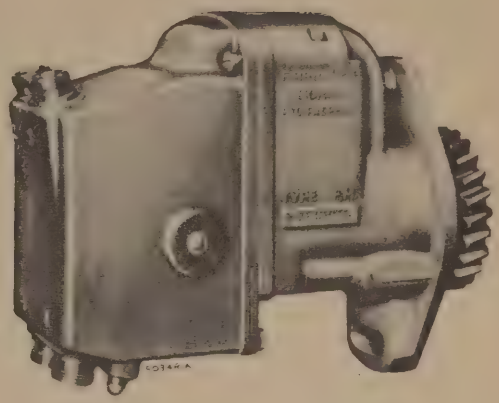
FAIRBANKS-MORSE

TYPES FM-XV4B7 AND FM-XVE4B7G MAGNETOS

Adapted only to Wisconsin VE4, VF4, and VP4D Engines



TYPE FM-XV4B7



TYPE FM-XVE4B7G

Field Service and Adjustment Information

GENERAL DESCRIPTION

Types FM-XV4B7 and FM-XVE4B7G magnetos are special units designed and built for use on Engine Models VE4, VF4, and VP4D, manufactured by the Wisconsin Motor Corporation. These engines are all modifications of the same basic design, each having a firing interval of 180°-270°-180°-90°. Types FM-XV4B7 and FM-XVE4B7G magnetos, each having a four pole rotor and a four lobe cam, meet this requirement by producing four sparks per revolution of the rotor, which runs at crankshaft speed. In a complete cycle of two engine revolutions, four sparks are used for ignition and four fire in the exhaust. These magnetos have the standard SAE flange mounting, but have a special coupling and drive gear arrangement which requires an extended rotor shaft.

SERVICE PROCEDURE

Improper functioning of the magneto is often believed to be the cause of engine difficulty arising from other sources, such as a flooded carburetor, insufficient fuel or air, loose ignition connections, or a defective spark plug. Since a brief engine inspection will often localize the trouble before the magneto is reached, it prevents maladjustment of parts in good condition. Type FM-X magnetos are built in sealed frames and should be opened only when it is certain that the ignition spark produced is unsatisfactory. This condition may be determined by ignition spark tests which are easily made in the field.

TESTING THE IGNITION SPARK

With properly adjusted spark plugs in good condition, the ignition spark should be strong enough to bridge a short gap in addition to the actual spark plug discharge. This may be determined by holding the end of the ignition cable not more than 1/16 in. away from the spark plug terminal. The engine should not misfire when this is done. Ignition tests made while any part of the system is wet are useless.

TESTING THE MAGNETO SPARK

Remove all the ignition cables from the magneto end cap sockets and insert a short, stiff wire in one of the sockets. Bend this wire to within 1/8 in. of the engine block. Turn the engine over slowly one complete revolution and watch carefully for the spark discharge which should occur every time the impulse coupling releases. Repeat this test with the wire in each of the other sockets. If a strong spark is observed with the wire in each socket, it is recommended that the magneto be eliminated as the source of difficulty and that the cables, terminals, and spark plugs be thoroughly inspected. If no spark occurs, the ignition switch should be

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March 1, 1951

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examined to make certain it has not accidentally become closed.

END CAP COVER REMOVAL

If no spark is obtained from one or more of the magneto terminals, remove the end cap cover, taking care not to damage the gasket. Remove the distributor rotor and clean the distributor compartment thoroughly, observing whether the air passages are open or clogged. IT IS EXTREMELY IMPORTANT THAT THESE AIR PASSAGES BE KEPT FREE OF DIRT AND OTHER FOREIGN MATTER. Examine the high-tension lead brush and replace it if noticeably worn or damaged. This brush should move freely in its holder and should be under slight spring pressure.

SERVICE OF BREAKER POINTS

Before examining the breaker points, it is first necessary to remove the end cap, which is sealed to the metal frame by a gasket joint. The breaker points should then be inspected for evidence of pitting or pyramiding. A small tungsten file or fine stone may be used to resurface the points except in the case of badly worn or pitted points, which should be replaced. If it is necessary to resurface or replace the breaker points, it will also be necessary to readjust them to their proper clearance, which is 0.015 in. at full separation. This adjustment is made in the following manner: Loosen the locking screws, identified in Fig. 1 shown below. Then move the contact support until the proper breaker point clearance is obtained. This is accomplished by means of a screwdriver inserted in the horizontal slot at the bottom of the contact support and pivoted between the two small bosses on the bearing support. Lock the assembly in place by tightening the locking screws and make a final measurement of the breaker point gap after the locking screws are tightened.

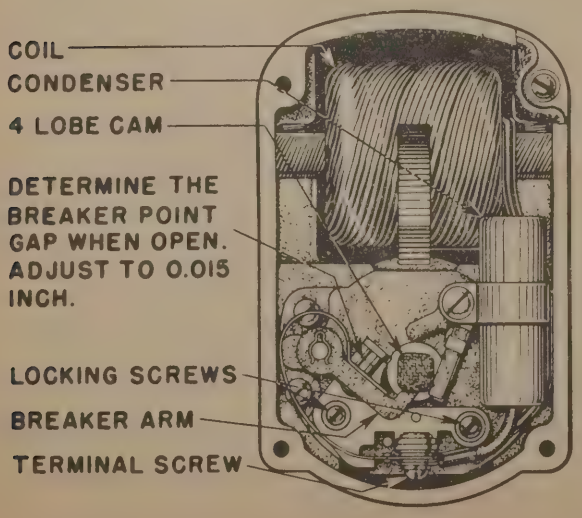


Fig. 1. End View of Type FM-XV4B Magneto.

FURTHER FIELD SERVICE NOT RECOMMENDED

The cam felt wick, if dry or hard, should be replaced by a new factory-impregnated wick. Other than this, Fairbanks-Morse magnetos do not require field lubrication and any attempt to oil or grease the bearings is inadvisable. The lubricants should be renewed only during a complete overhaul of the magneto by a Factory-Authorized Magneto Service Station. Coil and condenser replacements, while simple, are not recommended unless test equipment is available. Under no circumstances should any attempt be made to remove the magnetic rotor from the frame.

SEALING MAGNETO

Before replacing the end cap on the magneto frame, clean the contact surfaces between the cap and the frame. Then coat both contact surfaces completely with Fairbanks-Morse FMCO2 Gasket Varnish, place a new gasket in the joint, and mount the end cap on the frame, tightening the four screws securely.

SPECIAL DRIVE GEAR

Types FM-XV4B7 and FM-XVE4B7G magnetos, as adapted to engines manufactured by the Wisconsin Motor Corporation, are equipped with special drive gears mounted directly on the impulse coupling. The gear is a slip fit on the extended coupling nut, since movement of the gear with respect to the coupling nut and rotor shaft occurs during the impulse period. If it is necessary at any time to remove the drive gear, special care must be exercised in reassembly. Remove the end cap cover (the entire end cap on radio shielded units) and turn the rotor until the contact segment is in firing position for No. 1 cylinder as shown in Fig. 2. Notice that the No. 1 firing position of the contact segment is diametrically opposed in the two magnetos. With the distributor rotor in the proper position fit the gear to the impulse coupling lugs so that the prick punch mark on the rim of the gear is in the position shown in Fig. 2.

RADIO-SHIELDED MAGNETOS

Complete radio shielding of the ignition system is required in numerous applications, the necessary modification of the magneto being designated as the Type FM-XVE4B7G. On this unit the plastic end cap and end cap cover are replaced by an all-metal end cap in which an insulated distributor block is fitted. Special outlets are provided for the high tension leads so that

connection can be made to the shielded cables. A push-button ground terminal is located on the lower side of the end cap. In addition, an auxiliary terminal is provided to connect a ground wire from the magneto to a remote grounding switch.

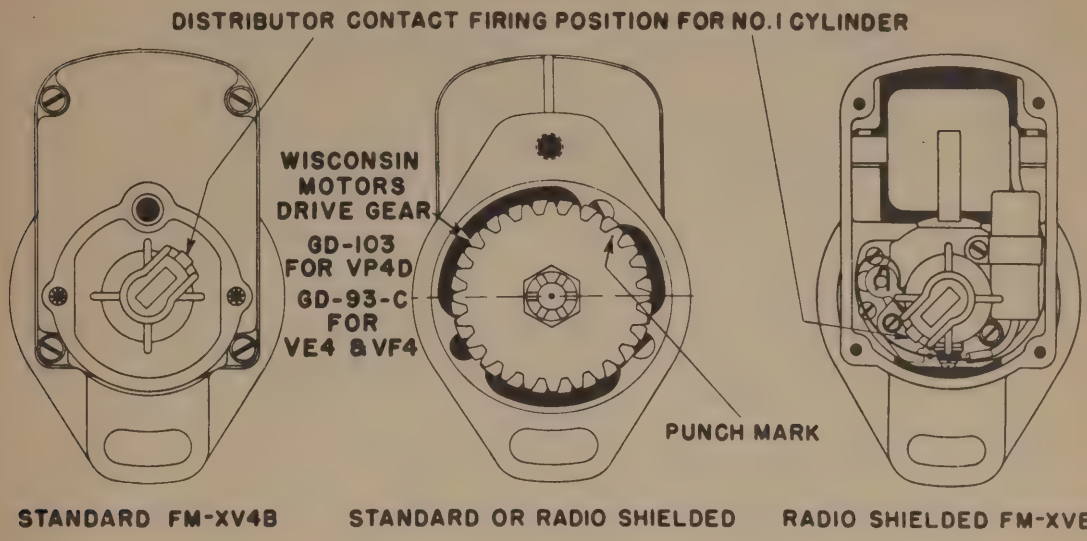
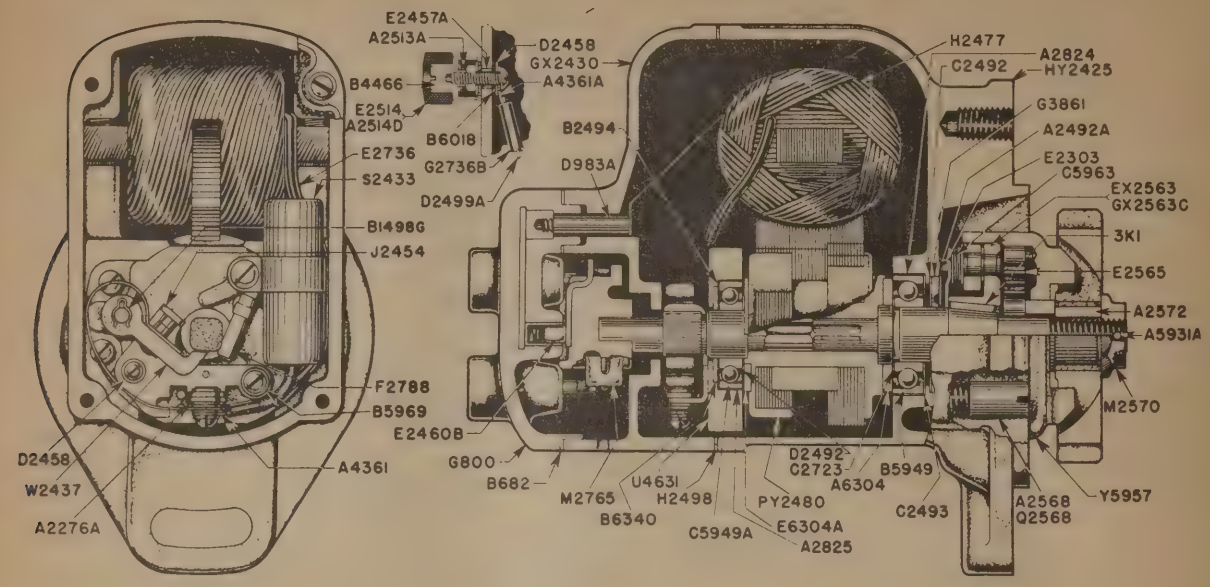


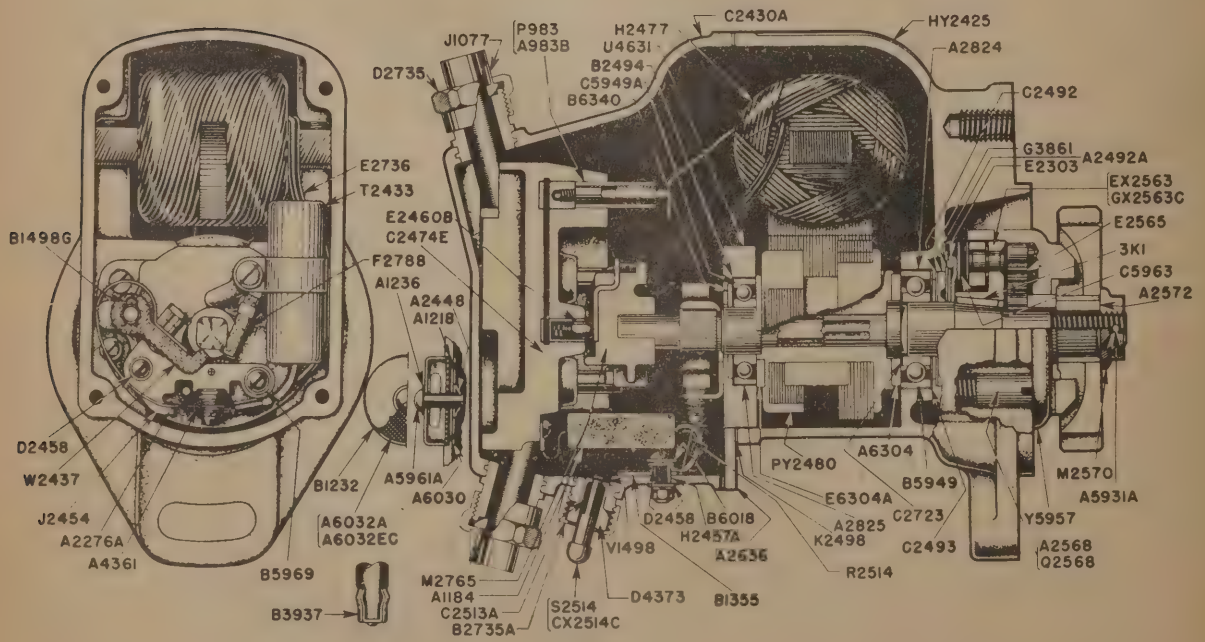
Fig. 2. Distributor Contact Firing Position and Drive Gear Marking.

PARTS LIST

Order by Part No.	Name of Part	No. Used FM-XV4B7	No. Used FM-XVE4B7G
B682	End Cap Cover Gasket	1	. . .
G800	End Cap Cover	1	. . .
8S9D	End Cap Cover Screw (#8-32x9/16")	2	. . .
P983	High Tension Lead (Inc. in A983B)	. . .	1
D983A	High Tension Lead Rod	1	. . .
A983B	High Tension Lead Assembly (Inc. P983)	. . .	1
J1077	Cable Outlet Ferrule	. . .	4
A1184	Interference Capacitor Assembly * (A1184 inc. A4361, A4361A)	. . .	1
A1218	Vent Screen Shield Gasket	. . .	2
B1232	Vent Screen Shield	. . .	2
A1236	Vent Rivet Gasket	. . .	2
B1355	Ground Switch Strip *	. . .	1
V1498	Ground Switch Snap Ring (Inc. in CX2514C)	. . .	1
B1498G	Breaker Arm Fulcrum Pin Snap Ring	1	1
A2276A	Contact Support Insulating Washer *	1	1
E2303	Oil Slinger Baffle Disc *	1	1
HY2425	Frame	1	1
GX2430	End Cap	1	. . .
C2430A	End Cap (Inc. A1218, B1232, A1236, A2448, A5961A, A6030, A6032A)	. . .	1
10S8A	End Cap Screw (#10-24x1/2")	. . .	2
10S10A	End Cap Screw (#10-24x5/8")	. . .	2
10S12D	End Cap Screw (#10-24x3/4")	4	. . .
S2433	Condenser Assembly	1	. . .
T2433	Condenser Assembly *	. . .	1
8S6D	Condenser Mounting Screw (#8-32x3/8")	1	1
W2437	Breaker Arm, Stationary Bracket & Points * (W2437 inc. J2454)	1	1



Type FM-XV4B7 Magneto (Standard)



Type FM-XVE4B7G Magneto (Radio Shielded)

Order by Part No.	Name of Part	No. Used FM-XV4B7	No. Used FM-XVE4B7G
A2448	Vent Screen Quickie	. . .	2
J2454	Contact Support Assembly (J2454 inc. in W2437)	1	1
6S5N	Breaker Arm Terminal Screw (#6-32x5/16")	1	1
6LW2	Breaker Arm Terminal Screw Lockwasher (#6)	1	1
6S6N	Contact Support Locking Screw (#6-32x3/8")	1	1
6LW2	Contact Support Locking Screw Lockwasher (#6)	1	1
8S6N	Contact Support Locking Screw (#8-32x3/8")	1	1
8LW3	Contact Support Locking Screw Lockwasher (#8)	1	1
E2457A	Primary Ground Screw Bushing	1	. . .
H2457A	Primary Ground Screw Bushing *	. . .	1
D2458	Contact Support Locking Screw Plate Washer	1	1
D2458	Primary Ground Switch Plate Washer	2	2
E2460B	Coil Lead Brush & Spring Assembly	1	1
C2474E	Distributor Block *	. . .	1
8S8N	Distributor Block Screw (#8-32x1/2")	. . .	4
8LW3	Distributor Block Screw Lockwasher (#8)	. . .	2
H2477	Coil Assembly * (Inc. E2736, A4361)	1	1
25SS12A	Coil Bridge Setscrew (1/4-20x3/4")	2	2
PY2480	Magnetic Rotor Assembly	1	1
C2492	Rotor Shaft Seal Inner Washer	1	1
D2492	Rotor Seal Retaining Washer	1	. . .
A2492A	Rotor Shaft Seal Outer Washer	1	1
C2493	Rotor Drive End Insulating Washer *	1	1
B2494	Bearing Support Bearing Insulating Washer *	1	1
H2498	End Cap to Frame Gasket	1	. . .
K2498	End Cap to Frame Gasket	. . .	1
D2499A	Primary Terminal Wire Assembly (D2499 inc. G2736B, A4361, A4361A)	1	. . .
A2513A	Primary Ground Switch Button Spring	1	. . .
C2513A	Primary Ground Switch Button Spring	. . .	1
E2514	Primary Ground Switch Push Button	1	. .
R2514	Primary Ground Switch Strip	. . .	1
S2514	Primary Ground Switch Push Button	. . .	1
CX2514C	Ground Switch Push Button Assembly (CX2514C inc. V1498, C2513A, S2514, D4373)	. . .	1
A2514D	Ground Switch Push Button Assembly (A2514D inc. E2457A, D2458, A2513A, E2514, B4466, B6018)	1	. . .
6S8N	Primary Ground Switch Screw (#6-32x1/2")	. . .	1
6S9N	Primary Ground Switch Screw (#6-32x9/16")	1	. . .
6N1	Primary Ground Screw Nut (#6-32)	1	1
6LW1	Primary Ground Screw Lockwasher (#6)	1	1
EX2563	Impulse Coupling Hub Assembly (UB-9, CW) (EX2563 inc. in GX2563C)	1	1
GX2563C	Impulse Coupling Complete (UB-9, CW) (GX2563C inc. EX2563, E2565, Y5957)	1	1
E2565	Impulse Coupling Drive Spring (E2565 inc. in GX2563C)	1	1
A2568	Impulse Coupling Pawl Stop Pin (1-3/16")	1	1
Q2568	Impulse Coupling Pawl Stop Pin (1-1/8")	1	1
M2570	Impulse Coupling Nut	1	1
A2572	Impulse Coupling Bushing	1	1
A2636	End Cap Extension Plate	. . .	1
10S6G	End Cap Extension Plate Screw (#10-24x3/8")	. . .	2
C2723	Rotor Shaft Shim (Use as needed)	2	2
D2735	Ball Seat Ferrule Nut	. . .	4

Order by Part No.	Name of Part	No. Used FM-XV4B7	No. Used FM-XVE4B7G
B2735A	Primary Ground Cable Outlet Nut	. . .	1
E2736	Coil Primary Lead Wire Tube	1	1
G2736B	Primary Terminal Wire Tube	1	. . .
M2765	Distributor Rotor *	1	1
F2788	Cam Wick and Holder Assembly	1	1
A2824	Rotor Drive End Bearing Insulator	1	1
A2825	Bearing Support Bearing Insulator	1	1
G3861	Rotor Shaft Seal	1	1
B3937	Cable Clip	. . .	4
A4361	Lead Wire Terminal for No. 8 Screw	3	3
A4361A	Lead Wire Terminal for No. 6 Screw	1	1
D4373	Ground Switch Bushing	. .	1
B4466	Ground Screw End Nut	1	. . .
U4631	Bearing Support Assembly	1	1
8S6D	Bearing Support Screw (#8-32x3/8")	4	4
A5931A	Impulse Coupling Nut Lockwire	1	1
B5949	Rotor Drive End Ball Bearing	1	1
C5949A	Rotor Ball Bearing (Opp. Drive End)	1	1
Y5957	Impulse Coupling Shell	1	1
A5961A	Vent Screen Rivet	. . .	2
C5963	Impulse Coupling Pawl Spring	2	2
B5969	Contact Support Locking Screw Washer	1	1
B6018	Primary Ground Screw Insulating Washer	2	1
A6030	Vent Screen Washer	. . .	2
A6032A	Vent Screen	. . .	2
A6032EC	Hooded Vent Screen Group (A6032EC inc. A1218, A1232, A1236, A2448, A5961A, A6030, A6032A)	. . .	2
A6304	Rotor Bearing Seal (Drive End)	1	1
E6304A	Rotor Bearing Seal (Opp. Drive End)	1	1
B6340	Bearing Support Felt Seal	1	1
3K1	Key (Rotor to Impulse Coupling)	1	1

* Fungus-treated Parts

FAIRBANKS, MORSE & CO.
Manufacturers

Executive Offices
Chicago, Illinois

Magneto Sales & Factory
Beloit, Wisconsin

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MY-32 6 PAGES

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WARRANTY

We guarantee each new engine sold by us to be free from defects in material and workmanship for six (6) months from date of shipment, but not to exceed ninety (90) days of service. The obligation under this Warranty, statutory or otherwise, is limited to the replacement or repair at our Milwaukee, Wisconsin factory, or at a point designated by us, of such part as shall appear to us, upon inspection at such point, to have been defective in material or workmanship.

This Warranty does not obligate us to bear the cost of labor or transportation charges in connection with the replacement or repair of defective parts, nor shall it apply to an engine upon which repairs or alterations have been made unless authorized by us.

We make no Warranty in respect to trade accessories, such being subject to the Warranties of their respective manufacturers.

We shall in no event be liable for consequential damages or contingent liabilities arising out of the failure of any engine or parts to operate properly.

No express, implied or statutory Warranty other than herein set forth is made or authorized to be made by us.

THIS MANUAL IS FOR MY WISCONSIN MODEL.....ENGINE

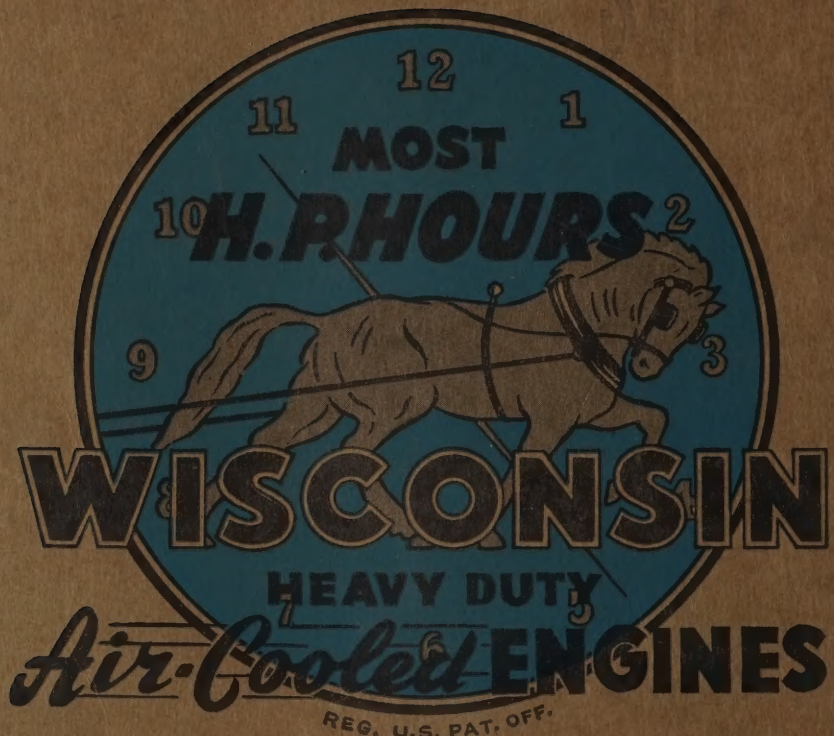
SPEC. No..... SERIAL No.....

THE ABOVE INFORMATION, WHICH WILL BE FOUND ON THE INSTRUCTION PLATE ATTACHED TO THE AIR SHROUD OF THE ENGINE, SHOULD BE FILLED IN. YOUR PROMPT ATTENTION TO THIS MATTER WILL MAKE IT CONVENIENT FOR YOU IN THE FUTURE, AS THIS INFORMATION MUST BE GIVEN WHEN ORDERING ENGINE REPAIR PARTS.

**For Your Own Record, Do Not Cut Out and Return to Factory.*

WISCONSIN MOTOR CORPORATION
MILWAUKEE 46, WISCONSIN

5950.99



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